

HP Professional

APRIL 1996

INSITES:
**HP, EMASS
& Heartlab** Page 14



UNRAVELING THE MYSTERIES OF HSM



SPECIAL REPORT

Client-Server Computing

- Terminal Emulation
- Migration Strategies

Page 28

Plug & Play
DLT

DLT Tape Solutions for Your HP 9000

Capacity, Performance & Reliability

These are all advantages inherent to Digital Linear Tape (DLT) technology. Your data-intensive applications require an "industrial strength" solution. DLT Tape offers exceptional durability and data integrity along with the ability to grow easily with your emerging needs.

Concorde Technologies, Inc. provides a full line of DLT tape solutions.

DLT Drives

- 20-40 GB Capacity/Tape*
- SCSI-2 Interface
- 2 Year Warranty
- 1040 GB Library Capacity*
- 1.5-3.0 MB/Sec. Drive Transfer Rate*
- 80,000 Drive MTBF
- 10,000 Hour Head Life

DLT Libraries

- 1-9 Drives/Library
- 3-of-9 Bar Code Reader
- Up to 264 DLT Cartridges
- Capacities to 10 TB/Library*
- Operator Load Port
- Hewlett-Packard Support
- Throughput to 1.3 TB/Hour*
- Cost-Effective Upgrades

DLT Software

- Backup/Restore Software
- "Hot" Database Backup
- Bar Code Support
- Client/Server Support
- HSM Software
- OmniBack II Support
- Lights Out Automated Operation
- Heterogeneous Network Support

Concorde specializes in high-performance network backup/restore solutions for HP 9000 Servers and Workstations. Backed by HP experience and a commitment to support, Concorde is an established leader among Hewlett-Packard Channel Partners.

To discuss your specific application or for a free backup/restore solutions catalog, contact a Concorde Sales Engineer.



**CONCORDE
TECHNOLOGIES**

800-359-0282



Channel
Partner

Concorde Technologies, Inc.

9770 Carroll Center Road, Suite F, San Diego, CA 92126-6504 USA
(619) 536-5500, (800) 359-0282, Fax: (619) 566-4396
E-mail: info@concordetech.com
<http://www.concordetech.com>

* Assumes 2:1 compression

HP
Recommended
& Supported

Model
452

Model
2700/4700

CIRCLE 232 ON READER CARD

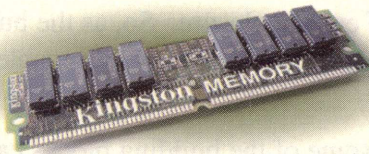
C O M P U T I N G W I T H O U T L I M I T S

← YOUR WALLET

THERE'S ONLY ONE PLACE YOU'LL NOTICE A DIFFERENCE
BETWEEN OUR MEMORY AND THE SYSTEM MANUFACTURER'S.



It's a little-known fact. Kingston® memory has exactly the same components, technology, and specifications as the leading workstation manufacturer's memory. Yet it costs up to 50% less. Maybe that's why more and more computing professionals are choosing Kingston, the memory specialists. After all, Kingston is the world's leading manufacturer of memory. Our engineers customize the design of each module according to the specifications set by workstation



manufacturers. In fact, Kingston has licensing agreements with Sun Microsystems® and Silicon Graphics®,* plus service agreements with DEC™ and IBM®. And just to prove how confident we are in our memory, we give it a lifetime warranty.

To get the memory that's just right for your workstation, call our toll-free number: (800)435-0669. You'll find that our memory is identical to your workstation manufacturer's in every way, except one: the price.

Kingston
TECHNOLOGY CORPORATION

For more information call us at (800) 435-0669



Visit our Web site: <http://www.kingston.com/hp.htm>

*Kingston has licensing agreements with Sun Microsystems to manufacture 100% compatible memory for SPARCserver 20, SPARCstation 20, SPARCserver 10, SPARCstation 10, UltraSPARC 1, and UltraSPARC 2; and with Silicon Graphics to manufacture 100% compatible memory for ONYX workstation, Challenge server, and Power Challenge computer systems. Kingston Technology Corporation, 17600 Newhope Street, Fountain Valley, CA 92708 USA, (714) 435-2600, Fax (714) 435-2699.
© 1996 Kingston Technology Corporation. All rights reserved. Kingston Technology is a registered trademark of Kingston Technology Corporation. All other products or services are the trademarks or registered trademarks of their respective holders.

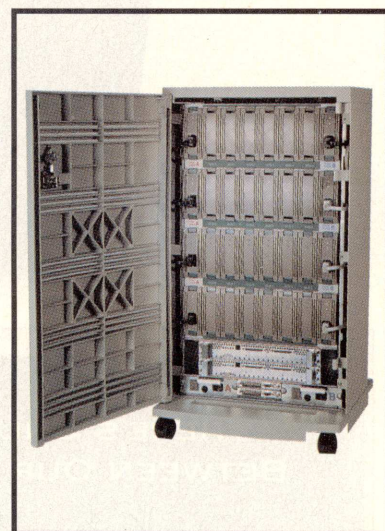
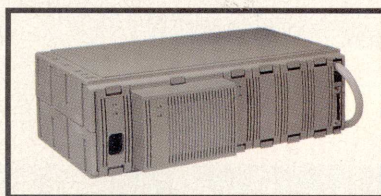
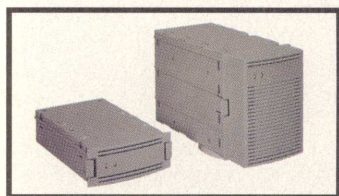
CIRCLE 281 ON READER CARD

Maybe you've outgrown this,

Visit our Home Page at
<http://www.iem.com>



But you won't outgrow this.



"It was fun while it lasted" is something you can say about your childhood, but should never have to say about your computer storage and backup solutions. And, with IEM's Building Block product line, you won't have to. Building Block products are modular, interchangeable devices which offer you unlimited combinations and configuration flexibility. The system is comprised of building blocks and enclosures.

Building blocks are 8mm, 4mm, DLT, CD-ROM, multifunction optical, floppy, and winchester units encased in carriers with the SCSI and power cables built-in. Enclosures are equipped with pre-configured SCSI backplanes and are available with 3-slots, 7-slots, 70-slots, or 168-slots.

The building blocks slide easily in and out of each enclosure. So, as the building block slides into place, all of the SCSI and power connections are made and the building blocks are hot-swappable in the event of failure (you don't even have to power the system down!).

As your needs outgrow one enclosure, all or some of the building blocks can be transferred to the next largest enclosure. IEM's Building Blocks grow with your needs.

Call us today and ask about **RAID!**

CIRCLE 122 ON READER CARD



In the U.S. and Canada:
IEM, Inc., P.O. Box 1889
Fort Collins, CO 80522 USA
Phone: (970) 221-3005
(800) 321-4671
Fax: (970) 221-1909
E-Mail: info@iem.com

In the United Kingdom:
IEM, Inc., Colorado House,
Cromwell Park, Banbury Road
Chipping Norton, Oxfordshire
OX7 5SR
Phone: +44 (0)1608 645000
Fax: +44 (0)1608 645155

All Others:
IEM International Sales
1629 Blue Spruce Drive
Fort Collins, CO 80524 USA
Phone: +[1] 970-221-3005
Fax: +[1] 970-221-1909
E-Mail: info@iem.com

Contents

April 1996

Vol. 10, No. 4

HSM: On A Pedestal Of Promise

By Pete Koliopoulos and Gerry Sutton

Most IS managers come not to praise HSM, but to bury it. Not so fast, Brutus. HSM was put on a pedestal of promise so high that even emperors wouldn't climb on. But HSM is still a brilliant technique that's only getting better. Et tu?

18

Tape It To The Limit

By Norm Kiefer

While the concept of RAID has remained unchanged since its inception, the words in the acronym have been changed to protect the innocent. It now covers more than just a bunch of cheap disk drives. Tape RAID is now here.

22

SPECIAL REPORT : Client-Server Migration

A Smooth Transition

Migrating to client-server environments can be taxing on your time and talents, not to mention your nerves. But, the transition doesn't have to spell instant disaster. It's also helpful if you can count on someone who already knows the client-server ropes.

28

End Of The Line For Terminal Emulation?

By Donna Gasiewski

Don't expect terminal emulation to be joining the North American spotted owl on the endangered species list any time soon. Reborn as "host connectivity" packages, vendors like WRQ, Attachmate and FutureSoft are providing a high tech touch to a low touch technology.

33

COLUMNS

UNIX At Large: Viva La Vim

By Fred Mallett

You don't have to go to France to appreciate its culture. And you don't have to like French cuisine to understand why vim is better than vi. But you do have to read this column if you want to savor all of vim's features in your next editing session.44

To And From The Desktop: Web Slingshot Via The Microsoft Gates-way

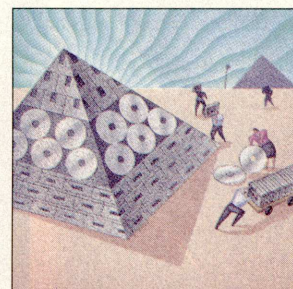
By Miles B. Kehoe

Although Microsoft got caught with its browser down, Bill G. still wants a big piece of the Internet action. And despite Netscape's overwhelming lead in the market, he just might get it. Why buy a browser when you can get it for free?48

& Another Thing... : Straight Talk

By Andy Marken

The Internet is great for E-mail. The Internet is good for communication. The Internet will save the world. Well, two out of three ain't bad.56



Editorial7

Industry Watch

By George A. Thompson
HP And SCO Develop 64-Bit UNIX; HP OpenView Supports Microsoft Windows NT; Developments With HP's Internet Strategy; New Incentives For Migrating From Sun; And ParcPlace-Digitaltalk /HP Smalltalk Agreement. ...9

New Products51

Reader Information/
Advertiser Index49

Product Showcase54

INSITES:

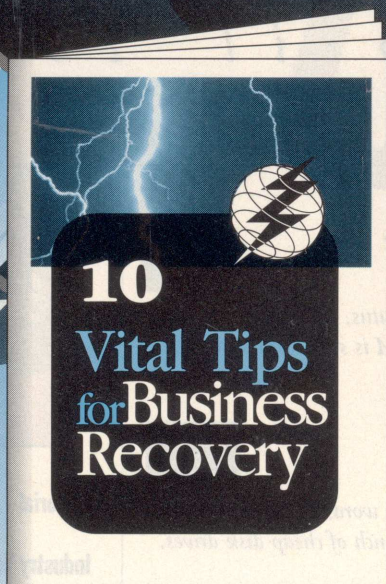
Duke University Medical Center Uses
Heartlab Inc.'s EchoNet and EMASST
AMASS Software In Their
Echocardiography Lab14

HP Professional

Cover illustration by Jae Shim

I.S. MANAGERS:

Read it, be prepared.



**Yours
Free.**

Whoever said "what you don't know can't hurt you," clearly didn't have any critical data to protect. If you do – if being off-line for even a few hours means being out of business – you'll want to get your hands on *10 Vital Tips for Business Recovery*. This concise, clear and informative booklet is an indispensable guide to anyone who must formulate a winning recovery strategy in the information age.

Written by some of the country's foremost experts in recovering

distributed systems and client-server

applications in demanding environments, it's packed with answers to questions about everything from planning, to testing methodology, to the expectations you should have about your recovery service providers.

Best of all, *10 Vital Tips for Business Recovery* is **FREE**.

The more important your data, the more you'll want to read it.

**Call 1-800-654-1689
today, for your free copy.**



**DATA ASSURANCE
CORPORATION**

We're ready when you aren't.

12503 East Euclid Drive, Suite 250, Englewood, Colorado 80111 303-792-5544

CIRCLE 466 ON READER CARD

HP PROFESSIONAL EDITORIAL ADVISORY BOARD

Patrick A. Adamiak
Marketing Manager for HP's Channel Partners (North America)

Nigel Ball
Marketing Director For HP's General Systems Division

Robert Bruen
Computing and Networking Manager at the MIT Lab for Nuclear Science

Frank Humphries
Director of Marketing at HP Asia Pacific Ltd.

Thomas Kucharvy
President of Summit Strategies

John R. Logan
Vice President of Aberdeen Group Inc.

Michael J. Meinz
Principal Technical Consultant at General Mills Inc.

Glenn Osaka
General Manager of HP's Professional Services Organization

Bard F. White
CIO and Worldwide Director of MIS for Spalding Sports Worldwide

HP Professional

EDITOR-IN-CHIEF Charlie Simpson
simpsoncm@box101.cardinal.com
SENIOR EDITOR George A. Thompson
thompsonga@box101.cardinal.com
ASSOCIATE EDITOR Deborah Schwartz
schwartzdr@box101.cardinal.com

COLUMNISTS

NETWORK MANAGEMENT Jill Huntington-Lee

PC NETWORKING Jim Carr

PC Miles B. Kehoe

UNIX Fred Mallett

CONTRIBUTING AUTHORS Donna Gasiewski, Norm Kiefer, Pete Koliopoulos, Andy Marken, Gerry Sutton

INTERNATIONAL EDITIONS EDITOR Karine Simpson

DESIGN & PRODUCTION

EXECUTIVE DESIGN DIRECTOR Leslie A. Caruso

ART DIRECTOR Al Feuerstein

ASSOCIATE ART DIRECTOR Jennifer Barlow

PRODUCTION MANAGER Carla Loughlin

CIRCULATION

CIRCULATION DIRECTOR Carrie Eisenhandler

DIRECTOR OF FULFILLMENT Margie Pitrone

MARKETING

PROMOTIONS DIRECTOR Timothy M. Kraft

MARKETING MANAGER Veronica L. Sutsko

SENIOR GRAPHIC DESIGNER Christine Piatkowski

GRAPHIC DESIGNERS Mark Broomell, Patty Wall

PUBLISHER Leslie Ringe

CARDINAL BUSINESS MEDIA, INC.

PRESIDENT AND CHIEF EXECUTIVE OFFICER

Robert N. Boucher

CHIEF FINANCIAL OFFICER

Thomas C. Breslin

VICE PRESIDENT, PUBLISHING

R. Patricia Herron

VICE PRESIDENT, HUMAN RESOURCES

Dorothy J. Flynn

VICE PRESIDENT, SPORTS & MUSIC DIVISION

Thomas J. Morgan

VICE PRESIDENT, RETAIL DIVISION

Marianne Howatson

For more information on how to contact your sales representative, see page 45. For address changes and other subscription information, please call (708) 291-5212 or FAX (708) 564-9002. In the U.S., missed issues must be claimed within 45 days of publication date; outside the U.S., missed issues must be claimed within 90 days. Editorial, advertising sales and executive offices at 1300 Virginia Dr., Ste. 400, Fort Washington, PA 19034 ■ (215) 643-8000 Corporate FAX (215) 643-8099.

HP PROFESSIONAL ISSN 0896-145X is published monthly by Cardinal Business Media Inc., 1300 Virginia Dr. Ste. 400, Fort Washington, PA 19034. Subscriptions are complimentary for qualified U.S. and Canadian sites. For reprints, contact Reprint Management Services, 505 E. Airport Rd., Lancaster, PA 17601; (717) 560-2001, FAX (717) 560-2063. Second Class postage paid at Fort Washington, PA 19034, and additional mailing offices. POSTMASTER: Send all correspondence and address changes to HP PROFESSIONAL, P.O. Box 3052, Northbrook, IL 60062. COPYRIGHT © 1996 by Cardinal Business Media Inc. CANADIAN POSTMASTER: Send all correspondence and address changes to Cardinal Business Media, C/O N.L.I., P.O. Box 44, RPO Rockwood Mall, Mississauga, ON L4Z 9Z9. All rights reserved. No part of this publication may be reproduced in any form without written permission from the publisher. All submitted manuscripts, photographs and/or artwork are sent to Cardinal Business Media, Inc. at the sole risk of the sender. Neither Cardinal Business Media, Inc. nor HP PROFESSIONAL magazine is responsible for any loss or damage. HP PROFESSIONAL is an independent journal not affiliated with Hewlett-Packard Company. HP and Hewlett-Packard are registered trademarks and HP PROFESSIONAL is a trademark of Hewlett-Packard Company.

Canada Post International Publication Mail Canadian Distribution Sales Agreement #HPM0264431

Printed in U.S.A.

ABP BPA

The benefits of rightsizing

are nothing short of miraculous.

But if you forgot about

production printing, you're going to need

a miracle

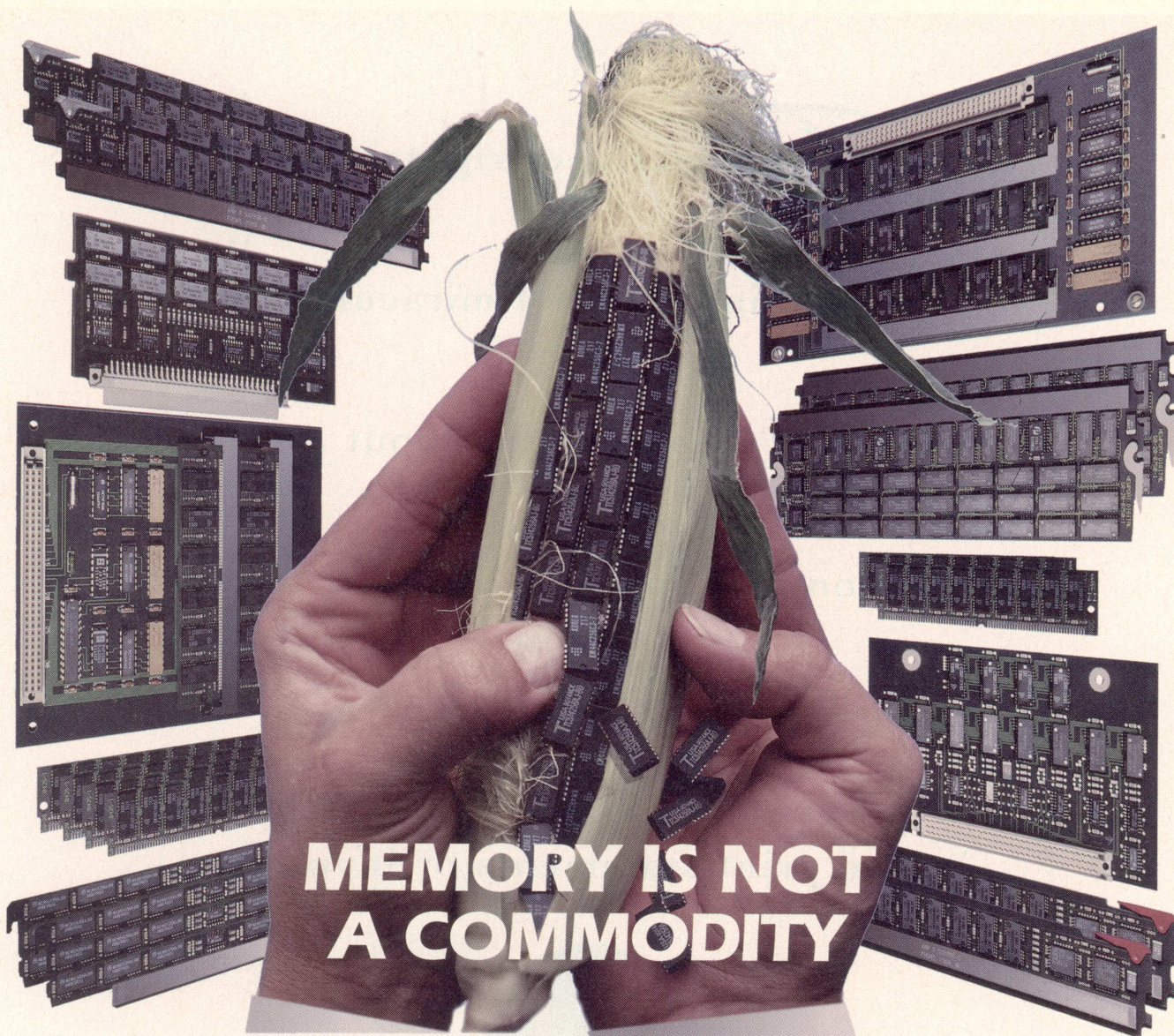
just to print statements or invoices.



Thankfully, miracles do happen. Xerox, the leader in production laser printing, and Hewlett-Packard, the leader in UNIX business servers, have joined forces to give HP 9000 users direct access to Xerox' family of 50+ ppm laser printers for enterprise-wide distributed production print solutions. So relax. Because now you can print your mission-critical documents where you need them, when you need them. With quality, speeds and reliability to meet your most demanding print applications. All backed by both companies' outstanding service and support. To learn more, call us at 1-800-ASK XEROX (ext.250). It's everything you've been wishing for.

THE DOCUMENT COMPANY
XEROX

 **HEWLETT®
PACKARD**
CIRCLE 183 ON READER CARD



MEMORY IS NOT A COMMODITY

DRAMs are traded like soybeans, pork bellies and crude oil. The market is volatile. Prices change daily.

Well designed, properly configured and thoroughly tested memory products are as rare as spotted owls.

It's your workstation. Your work. When you need memory, call Newport Digital.

You'll get the quality and service you expect from the leader in HP workstation enhancements. Superior products. Outstanding technical support. Very competitive prices.

HP Series	Mb	1	2	4	8	12	16	32	64	128	256
HP-200/310/320											
HP-319											
HP-330/350/370											
HP-332											
HP-340											
HP-345/375/380											
HP-360											
HP-362											
HP-382											
HP-400/425/433											
HP-425E											
HP-700RX											
HP-705/710											
HP-715/725											
HP-720/730/735											
HP-742/745/747											
HP-750/755											
HP-8X7/9X7											
HP-FXX/GXX/HXX/IXX											

Call today. Speak with an expert on Hewlett-Packard computers. See why memory worth having is not a commodity.

NEWPORT DIGITAL
1-800-383-3642

CIRCLE 246 ON READER CARD

Engineers Of Fortune

It's that time of year when press releases start mounting up, trade shows abound, and speculation and rumors run rampant. Speaking of which, have you heard the latest NT rumor that is flying about the various online discussion and user groups, as well as among the third-party vendor community? No? How about that the HP 3000 will soon be named an NT Server? Piqued your interest?

Sorry, that's all it is at this point — a rumor. Most analysts and management at HP have denied the story and described it as being pretty "whacky." But if it turns out to be true, remember you read it here first. So what is happening at HP and in the computer market in general? One thing's for sure, there's a lot going on and its happening fast. And not surprising, it is all good news — at least for HP. Anyone who reads my editorials knows I'm not an HP cheerleader, but it seems like HP is making all the right moves.

HP systems continue to gain ground in user popularity and performance. And in case you missed it, the nice guys and gals at HP were named *Forbes'* "Performer of the Year" for 1995, edging out GE, Intel, Wells Fargo, American International Group and Johnson&Johnson. The big news, however, comes on the UNIX side. According to the Aberdeen Group's (Boston, Mass.) 1995 "Commercial, Multiuser Risc/Unix" market review, HP now has a 49 percent share of the UNIX RISC-based worldwide commercial server market. If you're counting, that's \$7 billion or a 57 percent growth rate.

In case your wondering, the market segment as a whole showed a 43 percent increase which amounted to over \$14 billion for 1995. IBM showed a 45 percent growth rate, and retained a 19 percent share. Sun remained in third at 9 percent and showed a growth rate of 35 percent. Fourth place was taken by Siemens Nixdorf Information Systems at 6 percent, and fifth place was taken by Data General at 4 percent. The highest growth came from Digital at an impressive 73 percent. But because it is growing from a small base, its total revenues of \$475 million left it with a sixth-place 3 percent market share, according to the review. Aberdeen predicts that the market for commercial multi-user RISC/UNIX systems will continue to grow at a 40 percent plus rate in 1996, especially with the numerous applications introduced last year. You can be sure that HP will continue to gain as well, as IS managers standardize on one RISC/UNIX platform across the enterprise.

The transition to HP-UX 10 highlights other good news. While not every site has gone as smoothly as planned, HP, for the most part, has kept good on its promise to make upgrading as painless as possible. On the IS/IT side, The Boston Research Group (Boston, Mass.) reported in a recent study that lack of in-house expertise to integrate and maintain 32-bit PC-based operating systems is the top concern among information technology managers. According to the 200 managers surveyed, however, this concern won't prevent the massive purchase of new systems over the next 18 months. Also listed in the survey was the importance of consistent worldwide support. In fact, 83 percent of those surveyed said it was "critical or very important." Other items considered important were adequate infrastructures to provide services (71 percent) and multivendor support (66 percent). HP views these opinions and numbers as positive, and rightly so. Having set the model for worldwide partnering, HP is in a strong position to meet the needs of corporate IS.

So the Boy Scouts have matured. Like Engineers of Fortune, they have ingeniously planned their strategic advances and implemented them with tactical efficiency. HP customers are obviously responding. And by now, even skeptical IS/IT managers must know that means HP continues to be a safe investment.

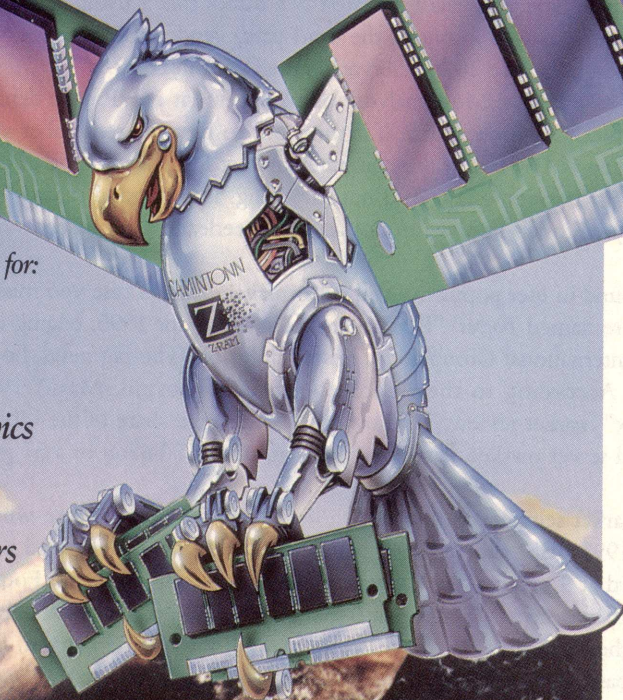


**Charlie
Simpson**

Charlie Simpson

Camintonn Z-RAM.[®] Delivering Memory To The World.

Memory products for:
digital
HP Apollo
IBM RISC
Silicon Graphics
SUN
PCs and
Laser Printers



Camintonn Z-RAM customers come back again and again because of our 15-year record of proven leadership. Not just in high quality products, but also in prompt customer service, knowledgeable technical support, and a 24-hour repair-or-replace guarantee. Backed by a lifetime warranty.

And since Camintonn Z-RAM has the broadest line of memory products available, designed and rigorously tested in the United States, the quality product you need is ready for immediate delivery world-wide. What's more, we're almost always the first to offer 100% compatible memory for the newest systems – often before they're available from the original manufacturers.

Guaranteed performance and a 15-year track record of growth and financial stability. Call us at 1-800-368-4726 for an immediate quote for your system.

FREE Camintonn Z-RAM Atlas Your Guide To The World Of Memory

Fax this form back to us and we'll send you a Windows version of The Automated Upgrade Guide – (3.5" disk) a \$49.95 value!

Name _____
Title _____
Company _____
Street _____
City/State/Zip _____
Phone _____ Fax _____

Which computer platforms are currently in use at your company? (check all that apply)

DEC _____ SGI _____
HP _____ SUN _____
IBM _____ PC LANs _____

CAMINTONN[®]
CORPORATION
The last word in memory[®]

Tel: 800/368-4726 or 714/454-1500
Fax: 714/830-4726
U.K. Tel: 44/ 1 865-784747 • Fax: 44/ 1 865-784750

Camintonn/Z-RAM world headquarters located at 22 Morgan, Irvine, CA 92718-2202. European headquarters located at Oxford Science Park, OX4 4GA, U.K. © 1996 Camintonn Corporation. Product and company names are trademarks or registered trademarks of their respective companies.

CIRCLE 294 ON READER CARD

INDUSTRY WATCH

George A. Thompson

HP-SCO UNIX STREAM FLOWS
MORE WAYS THAN ONE

At Uniforum in San Francisco, HP and the Santa Cruz Operation (SCO; Mountain View, Calif.) announced a "next-generation UNIX system *technology stream* that will form the basis of distributed UNIX for the next decade." The technologies that come out of the HP-SCO joint development will "flow into HP-UX as well as SCO's operating system line," according to Scott McGregor, SCO's senior vice president for products. According to Rich Sevcik, vice president and general manager of HP's Systems Technology Group, "we're simplifying porting, software development and systems management for OEMs, ISVs and end users."

Although it was widely reported in the trade press as a single unified 64-bit UNIX OS, "that's wrong," states McGregor in an exclusive *HP Professional* interview. Consequently, HP-UX and SCO's OpenServer will continue to be available for the foreseeable future. SCO, in fact, is consolidating its OpenServer and UnixWare (recently acquired from Novell) OSes into a high volume Intel-based UNIX OS beginning in 1997. Code-named Gemini, it will also include certain features of HP-UX.

Another misperception according to McGregor is that the development pertains primarily to Intel CPU-based platforms. While he admits that HP and SCO are primarily focused on Intel, "we will support other platforms through other partners." In fact, NEC has already announced plans to port the technology to MIPS-based platforms. NEC is also part of HP's Precision RISC Organization (PRO), which has also announced their support. PRO members include Allegro Consultants Inc. CS (France), CPI Inc., Hitachi

Ltd., Information Builders Inc., Innovus Inc., Interex Corp., Kelly Computers Inc., Mitsubishi Electric Corp., OKI Electric Industry Co., Oracle Corp., Rational Software Corp., Samsung Electronics Co., Stratus Computer Inc., Winbond Electronics Corp., Wind River Systems Inc. and Yokogawa Electric Corp.

The foundation of the new technology is called the 3Dimension Architecture (3DA), for the three (OS design) dimensions that it includes — modular functionality, processor optimization and system optimization. As an example, McGregor cites Windows NT as a one dimensional OS, "because it just has the processor or hardware optimization layer." Full support for the 32- and 64-bit extension to the Single UNIX system specification standard is expected to be delivered in 1997, starting with the first shipments of the Intel Merced CPUs. The new HP-SCO technology will be developed using ASPEN, the 64-bit UNIX standard API. ●

AN HP OPEN VIEW OF
THE ENTERPRISE

After consolidating all of its computer divisions last year under Rick Belluzzo (see our interview with Rick Belluzzo in the November 1995 issue), HP, once shy about showing any kind of support for Microsoft Windows products, is now deadly serious these days about integrating UNIX and Windows environments — especially in an HP sort of way.

The first week in March, HP launched a three-pronged strategy for managing Windows NT-based (and Novell) LANs with HP's OpenView. The CSO-wide initiative included virtually every HP computer division — the Network & System Management Division (NSMD), Software Services

OpenView Products Supporting Windows NT	Scheduled Availability
Network Node Manager for Windows NT	second half of 1996
PerfView for Windows NT	second half of 1996
NetMetrix for Windows NT	second half of 1996
OmniBack II for Windows NT	second half of 1996
IT/Operations for Windows NT	statement of direction
IT/Administration for Windows NT	statement of direction

and Technology Division (SST), OpenView Operation (OVO) NetMetrix Network Server Division, Grenoble Personal Computer Division (GPCD) and the Roseville Networks Division (RND).

The announcement included: new Windows NT- and Novell NetWare-based agents for HP's IT/Operations, IT/MeasureWare, IT/Administration, OpenSpool and OmniBack II, its enterprise management products; complete Windows NT support for HP PerfView, IT/Operations, IT/Administration and OmniBack II, as well as HP OpenView Network Node Manager (NNM); and Novell- and Symantec-supplied HP OpenView integration solutions.

"The OpenView installed base has been eagerly awaiting an announcement concerning NNM on NT for some time," says Jill Huntington-Lee, a senior analyst at Datapro Information Services (Delran, N.J.). "But it's still not happening fast enough." Overall (see chart above), Lee notes that while HP is ahead of Sun when it comes to Windows NT support, its Windows

NT support for OpenView is behind Digital's PolyCenter NetView on NT, which shipped about a year ago. "HP is still behind the curve when it comes to meeting customer demand for availability." ●

HP'S CORPORATE INTRA-DUCTION

Continuing its aggressive push to satisfy the demand for intranets, HP announced a marketing alliance with ANS (Reston, Va.), an Internet Service Provider (ISP). Called the Managed Intranet Solutions or MIS service, it will be sold jointly with HP's Internet Group and ANS, a subsidiary of America Online (AOL). While HP will provide its HP 9000 server product line and support from HP's Professional Services Organization (PSO), ANS will provide its 45 Mbps network infrastructure (including dedicated nationwide access at speeds up to T3 and dial-up V.34 access) as the principal backbone.

Another part of HP's Internet strate-

gy (see Industry Watch, March 1996) became apparent when HP announced the signing of a definitive agreement to acquire Internet/World Wide Web security technology from SecureWare Inc. (Atlanta, Ga.). Built on a so-called "trusted operating system," it permits sensitive transaction data to be transmitted over the Web. The trusted operating system provides mandatory access control, networking security, and improved audit and log-in capabilities which meet the highest level of U.S. government certification.

HP will acquire a substantial, but undisclosed portion of SecureWare's assets. And HP will license SecureWare's Hannah (its networking-security software) and Troy (its file-protection software). SecureWare will concentrate on complementary security technologies and services.

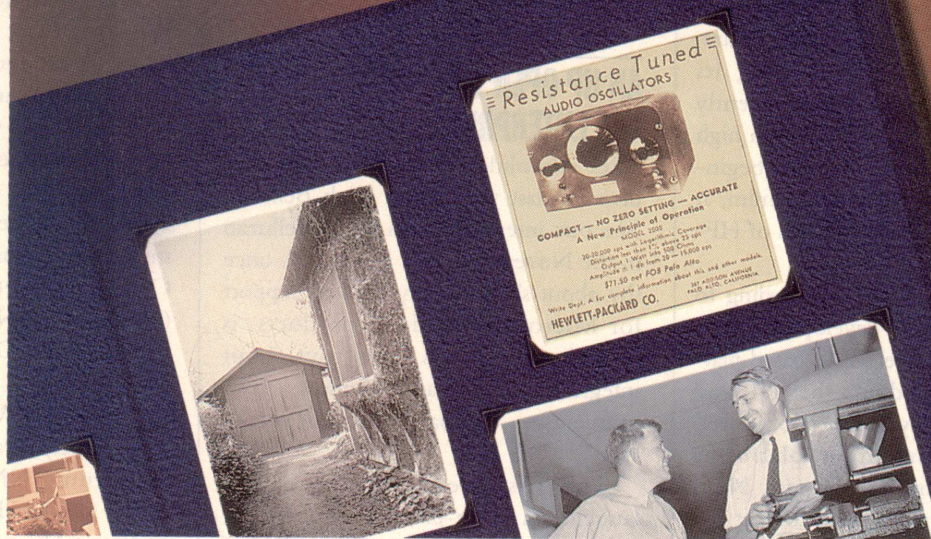
HP and SecureWare originally commercialized the technology in 1995 to protect the transactions of Security First Network Bank (SFNB; www.sfnb.com), the first federally approved and

insured Internet bank. Since then, HP, SecureWare and Five Paces Software Inc. (Atlanta, Ga.) have been offering the same solution to financial services institutions. SecureWare has developed the Global Decision Support System for the U.S. Air Force Mobility Command.

In yet another related Internet announcement, HP announced that it intends to make an equity investment in Business@Web (Cambridge, Mass.), an Internet business-application development company. In addition, the two companies have agreed to do joint marketing and Internet consulting.

Consequently, HP's PSO and Business@Web will begin to offer solutions using Business@Web's OpenScape development software, which extends legacy and client-server applications across intranets and the Internet. Business@Web is spin-off from the Cambridge Technology Group, a systems integrator located in Cambridge, Mass. ●

HP's priceless memories.



Major Price Reductions

We've reduced our add-on memory prices by an average of 35% for HP 9000 servers and workstations. HP 3000 systems too! Which

means you can get genuine HP quality, the convenience of dealing with a vendor you know, and great pricing!

HP APPLIES THE SUN SCREEN

Everyone's aware that too much sun isn't good for you. Although HP can't help you at the beach this summer, the company still wants to help you with a Sun screen of a different kind. In mid-March, HP announced an extra incentive to their Sun Open Migration Program. HP is now offering Sun Microsystems (Mountain View, Calif.) customers an extra \$2,245 value by providing free HP-UX 10.10 System Administrator Training (a Sun Interoperability Guide and Sun Porting Manual also are included). That's in addition to the up to 20 percent discount applied when a Sun server is traded-in on a purchase of an HP 9000 server.

Since the Sun Open Migration program began in April 1995, 35 companies, including Lockheed Martin, Hughes Space and Communications, Ohio State University and Philips NV Medical Systems have migrated from a Sun to an HP platform. According to a

recent report from the Aberdeen Group (Boston, Mass.), HP now has a 49 percent share of the UNIX/RISC-based server market (an increase of four points from last year). HP is attempting to take advantage of what is perceived to be a weak spot for Sun's commercial customers who must either upgrade their Sun SPARC-based systems to its 64-bit UltraSPARC platform or go through a particularly tricky OS migration from SunOS to Solaris 2.5. ●

WALKING THE WALK AND TALKING THE SMALLTALK

ParcPlace-Digitalk and HP inked a joint development and licensing agreement for Distributed Smalltalk. Under the terms of the agreement, HP grants ParcPlace-Digitalk the exclusive rights to enhance, market, distribute and support Distributed Smalltalk as well as use the technology in the development of future products. ParcPlace-Digitalk will port Distributed Smalltalk to its core

products VisualWorks 2.5 and Visual Smalltalk Enterprise 3.1 later this year.

Distributed Smalltalk 5.0, based on the Object Management Group's Common Object Request Broker (CORBA) 2.0 specification and originally developed at HP, can enable programmers to develop and deliver multi-tiered object-oriented distributed applications. CORBA 2.0 includes the Internet Inter-ORB Protocol (IIOP), which is designed to enable objects and applications to interoperate over a network with other CORBA 2.0-compliant ORBs. Distributed Smalltalk, as developed by HP, is built on ParcPlace-Digitalk's Visual Works application development environment.

Priced at \$4,995 for UNIX platforms (HP-UX, IBM AIX, SunOS and Solaris) and \$2,995 for PC platforms (Windows 3.1, Windows NT and OS/2), Distributed Smalltalk is expected to be available through existing ParcPlace-Digitalk distribution channels worldwide. ●

HP's memories, priced less.



Quick Delivery

We've not only reduced prices. We've improved delivery time as well. And ordering is easy. Just call 1-800-56MBYTE, or contact your local

HP authorized reseller. So forget wasting your time calling all over the country for a great deal on add-on memory — and call HP!

An AS/400® Advanced Series Solution

Behind Bill Creekmuir's
success in keeping LADD
Furniture on the cutting edge



is a vision of
where interior design
is headed



and business solutions
from Software 2000® that point
him in the right direction.



He was also the first to see that AS/400 Advanced Series would furnish a cost-effective way for their divisions to share both information and resources.

Even a furniture manufacturer that moves custom designs around the world can run into delays moving data across the street.

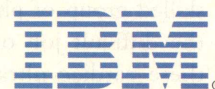
*So when the need arose for a computer system that could keep its 12 operating units connected, LADD Furniture turned to AS/400 Advanced Series and financial management and human resources solutions from Software 2000.**

As CFO, Bill saw that AS/400 Advanced Series provided the flexibility to access the information he needed, at a moment's notice. And at less cost to the company.

Software 2000's business solutions also meant having one companywide financial, payroll and personnel system. A move that would free up resources at each of LADD's units.

What's more, individual operating companies are now able to run daily management reports without having to wait for corporate accounting. So each has greater control over building its furniture and its business.

If you'd like to find out more about how AS/400 Advanced Series and Software 2000 can help you manage your company's growing financial and human resources, call us at 1 800 IBM-3333, ext. BA013. Or visit our home page at <http://www.as400.ibm.com>



Solutions for a small planet™

Software 2000 is a registered trademark of Software 2000, Inc. IBM and AS/400 are registered trademarks and Solutions for a small planet is a trademark of International Business Machines Corporation. * IBM makes no representations or warranties regarding non-IBM products. The IBM home page can be found at <http://www.ibm.com>. For more information about Software 2000 call 1 800 725-7668, or visit their home page at <http://www.s2k.com> ©1995 IBM Corporation.

CIRCLE 149 ON READER CARD

Ultrasound Images In A Heartbeat

Although HSM is a good overall solution, it may not always be the answer in some applications. For example, Duke University Medical Center is now effectively using a *direct access system* to manage an unprecedented number of digital ultrasound images in its echocardiography laboratory. Unlike HSM archival systems, direct access storage enables you to create files directly on secondary storage (optical disk or magnetic tape) using the standard magnetic disk access methods of the host operating system.

Heartlab Inc. (Providence, R.I.), a developer of high performance medical image systems is responsible with its partner Lockheed-Martin for system integration within the hospital's busy diagnostic laboratory. Heartlab has integrated their EchoNet digital ultrasound management system with AMASS direct access software from EMASS Inc. (Englewood, Colo.) along with HP equipment (see configuration box, p.18). The system takes digital data directly from an ultrasound cart and stores it on a central server in a compressed format. At review stations located throughout the hospital, doctors can search for a specific set of tests stored online on the central server. Or, they can access older images which are being tracked by the direct access software but are being stored offline in an archive.

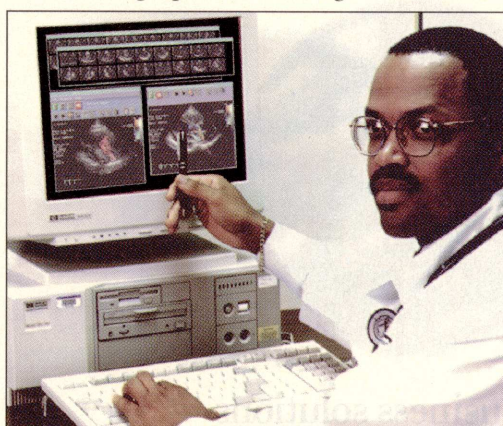
Echocardiographers, a highly skilled group of physicians, have the difficult job of interpreting these cardiac ultrasound image studies. And on a typical day, they will conduct as well as read

about 50 ultrasound studies. Physicians need to be able to control where specific data is located in order to get at it within seconds. To make this possible, Heartlab chose to implement AMASS direct access software with the laboratory's central server and optical disk devices. Designed as a distributed architecture, there are separate demographic and image

videotape. Consequently, the Heartlab/EMASS solution has virtually replaced traditional methods of storing echocardiography images on conventional videotape.

In the past, these digital image studies were acquired from a primary imaging device and then stored directly on videotape. Unfortunately, doctors sometimes had to scan a large number

of tapes just to find a particular set of motion images. To complicate matters, if a patient required re-testing, the doctor often would need to refer back to the original study, to aid in diagnosis. This meant once again having to locate a specific section on a tape. To escape this arduous, time-consuming task, some doctors eliminated



Heartlab has integrated their EchoNet digital ultrasound management system with AMASS to directly access digital ultrasounds.

the videotape scanning process entirely, instead referring only to the original report.

Another reason why Heartlab chose a direct access software solution over HSM was because of the software's efficiency in distributing large files. "The typical image file size that we're dealing with in the echocardiography lab is about 2 MB," says Bob Petrocelli, president of Heartlab. "It's very important that we're able to burst that very rapidly over the medical center's network. With AMASS, even at the optical jukebox level, we're able to get very good performance because we're able to tune the read-ahead buffering so

the videotape scanning process entirely, instead referring only to the original report.

Another reason why Heartlab chose a direct access software solution over HSM was because of the software's efficiency in distributing large files. "The typical image file size that we're dealing with in the echocardiography lab is about 2 MB," says Bob Petrocelli, president of Heartlab. "It's very important that we're able to burst that very rapidly over the medical center's network. With AMASS, even at the optical jukebox level, we're able to get very good performance because we're able to tune the read-ahead buffering so

Heaven knows, today anything goes. We've got bikers in choirs, and with new SoftWindows 2.0 for UNIX, any Windows application can run on a UNIX workstation. Which means 100% compatibility, without missing a beat. Amazing grace.



INSIGNIA
SOLUTIONS

Introducing SoftWindows 2.0 for UNIX, software that brings together even the most diverse groups. Now UNIX users can run any enhanced mode Windows application and any MS-DOS program. Applications like Microsoft Office, Lotus SmartSuite, and Novell PerfectOffice. UNIX users can use their workstation peripherals as PC peripherals. They can share files, swap data, and even copy and paste text and graphics between UNIX and PC applications. All from one desktop.

New!
SoftWindows
Version 2.0
for UNIX



What's more, SoftWindows keeps your entire enterprise in tune, by providing complete support for PC networking. People can use the same e-mail system. Corporations can standardize on

Windows applications. All of which minimizes training costs and reduces maintenance expenses. And best of all, UNIX and Windows users can work in perfect harmony. So call today for a free evaluation copy of SoftWindows 2.0 for UNIX for Digital, HP, IBM, Motorola, SGI, or Sun workstations. And see how compatible your enterprise can be when everyone's singing from the same page.

Best New Product 1995
—The X Advisor

Call 508/682-7600

SoftWindows for UNIX

Run Windows On UNIX

Insignia and Insignia Solutions are registered trademarks of Insignia Solutions Inc. SoftWindows is a trademark used under license. Microsoft, Windows, and MS-DOS are registered trademarks of Microsoft Corporation. UNIX is a registered trademark licensed exclusively through X/Open Company, Ltd. All other product names are trademarks or registered trademarks of their respective owners. ©1995 Insignia Solutions Inc. All rights reserved.

CIRCLE 218 ON READER CARD

HERE'S YOUR SOLUTION!

Quality products at affordable prices for
HEWLETT-PACKARD/APOLLO®

**Workstations,
Peripherals and Upgrades**

- NEW and REFURBISHED
- Repairs
- 100% Customer Satisfaction
- Free Technical Support
- Immediate Delivery



CMI

Computer Marketing International, Inc.™

85 Flagship Drive
No. Andover, MA 01845 USA

Tel: 800-497-4264
508-687-3700

Fax: 508-689-2031
Int'l. Fax: 508-687-4395

CIRCLE 496 ON READER CARD



GE Capital
Computer Rental Services

Our Business Is Helping Yours®

**UNIX Workstation
Rentals**

Now's the Time to Rent the Newest UNIX Workstations!

- Cost-effective rental of the latest HP, Silicon Graphics, Sun, and Tadpole workstations:
- HP C Class
- HP Model 715
- HP Model 735
- Silicon Graphics Indy™
- Silicon Graphics Indigo2™
- Sun SPARCstation 5
- Sun SPARCstation 10
- Sun SPARCstation 20
- Sun Ultra 1 Systems
- Tadpole SPARCbook

Plus new products available as released by manufacturers!

- Large inventory – Fast delivery
- Flexible rental & leasing options—Rent-to-Own
- Major credit cards accepted

Call 1-800-GE-RENTS!

Authorized Rental Company For:



**HEWLETT
PACKARD**



Silicon Graphics
Computer Systems



**TADPOLE
TECHNOLOGY**



Sun Microsystems
Computer Corporation



CIRCLE 166 ON READER CARD



that it would be consistent with the average file size.

That eliminates the need to have to perform a staging operation to free up room for these older images on primary magnetic storage. Most data is less than 72 days old, so if we constantly had to retrieve it off the optical jukebox back to the server disk, the process could potentially kick off more valuable data or it could cause us to have to purge cache blocks, as might be the case with some HSM schemes."

Duke Medical Center Echocardiography Laboratory System Configuration

**8 — HP 9000 (700) Series
central processor workstations
(review stations)**

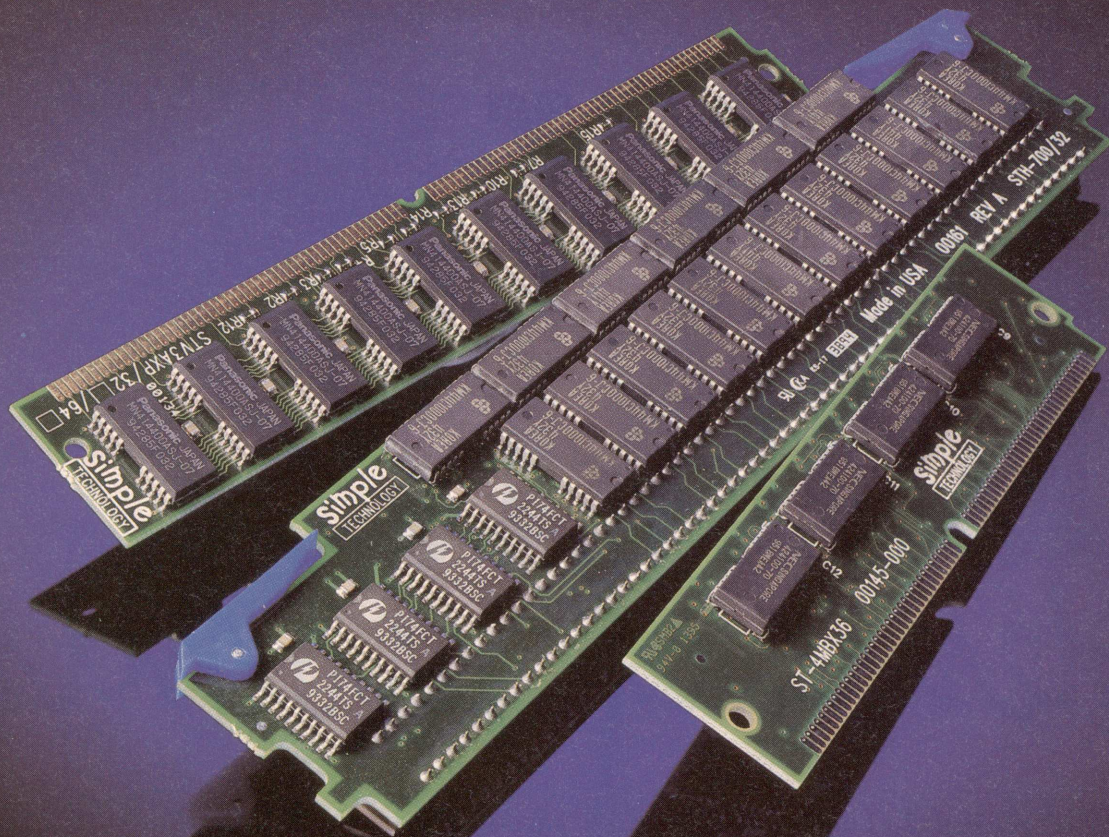
**1 — HP 9000/725 used as a central
server sitting on a FDDI ring**

Operating system — HP-UX 9.05

**EMASS Inc.'s AMASS direct access
software**

**Heartlab Inc.'s EchoNet Digital
Ultrasound Management System Software**

Heartlab's systems integration personnel have discovered another important benefit with direct access software — installation and integration have been easier and more seamless than with some HSM counterparts. "We're currently testing HSM solutions using our systems simulator," says Petrocelli. We've found that in some instances, HSM products aren't as robust as direct access software solutions. For instance, it took us two weeks to fully implement one of the new HSM products. AMASS only took a day to implement and integrate with the system. We've never had a down day with it." For Duke Medical Center's echocardiography laboratory, direct access secondary storage has improved medical care for patients. —Gerry Sutton, Contributing Author.



What goes into your workstation memory is as important as what goes into your workstation.

A workstation is no place for unproven components. Especially memory upgrades.

So, make sure yours is from Simple Technology. Because no one puts more into workstation memory than we do.

Uncompromising Engineering

High-performance workstations require high-performance memory. And ours performs like a thoroughbred.

Every Simple Technology memory product is designed to meet or exceed your workstation's requirements.

Individual system-level testing in actual workstation guarantees 100% compatibility.

And strict quality control in our manufacturing facilities results in memory products that really last a lifetime.

Simple Technology also keeps your workstation on the leading edge with new advances like our revolutionary IC Tower™ chip stacking technology.

Wide Product Selection

Whatever your workstation, we've got the memory. In standard configurations up to 256MBs.

Best of all, we're committed to maintaining in-stock inventory, so the products you want are often shipped the same day.

INDIVIDUALLY TESTED
100% COMPATIBLE

LIFETIME WARRANTY

Digital
Hewlett Packard
IBM
Silicon Graphics
Sun

Service, Support, Satisfaction

Feel good knowing your memory is made by the world's fastest growing memory manufacturer.

We offer free and unlimited technical support, a product evaluation program that can put any of our 1000+ products in your hands instantly, and a proven track record for consistently being first to market with new workstation memory.

Call For Your Free Catalog

Call **800-4-SIMPLE** today to receive your free Simple Technology Workstation Memory Upgrade Catalog. Or call to find a dealer or reseller near you.

Put the reliability and power of Simple Technology memory in your workstation.

UNLIMITED
TOLL-FREE
TECH SUPPORT

EVALUATION PROGRAM

800-4-SIMPLE
800-474-6753

Simple
TECHNOLOGY
INCORPORATED

Memory and PCMCIA Solutions™

CIRCLE 261 ON READER CARD

For instant information contact our faxback at **800-429-5626 x500**

©1995 Simple Technology, Inc. All product names are trademarks of their respective companies. Simple Technology and the Simple Technology logo are trademarks of Simple Technology, Inc. Outside the US call (714) 476-1180.

HSM:

On A

pedestal of promise

A “pedestal of promise.” That’s where storage administrators were eager to place hierarchical storage management (HSM) after it was unveiled to the UNIX world several years ago. After all, HSM had been ballyhooed as the answer for anyone needing a more cost-effective approach to storing and accessing large amounts of data. HSM promised to free system administrators from the mundane chores of managing disk space and storage archives through sophisticated automated data management.

HSM promised other benefits too, like automated administration of storage to safeguard against loss, and shared access to data storage across heterogeneous environments where necessary. And, HSM also promised the ability to manage large data archives in a cost-to-performance fashion to help minimize the expense of keeping the data available. And to HSM’s credit, it has lived up to most of those promises. On the other hand, some of the promises have not been kept.

HSM systems attempt to provide automated administration so that files

are protected against loss, and so you can share storage resources wherever necessary. Large storage archives can be managed in a cost/performance trade-off which minimizes the cost of keeping all files available online. In addition, most HSM systems are designed to provide a view of the managed data to appear as though it is resident on magnetic disk. Best of all, HSM can help you become an instant hero because, at least in theory, it reduces your data storage costs by slowing down the proliferation of expensive client-server disk hardware while helping you better use

your existing data storage investments.

File migration is still the main focal point of the HSM. It works this way: You set up migration partitions and assign pre-defined migration policies. Users are given some level of control over the factors determining which files are migrated, such as access times or modification times or size. However, it’s the migration software that automatically performs the move.

HSM software usually stitches into the operating system kernel and traps calls to files in migration partitions. Then, files are migrated from the primary magnetic disk storage to secondary storage in order to maintain free space for new files on the magnetic disks. If the HSM software is clever, it will retain just a portion of the file called a stub file or “fence post” and a pointer on the magnetic disk. These are used so “reloads” or accesses that don’t require more than just the first few hundred bytes can be satisfied without having to retrieve the entire migrated file.

First, HSM can still be a bit tricky to implement. That’s because it’s not easy to fool a system into thinking its data is elsewhere and still allow you to retrieve

Pete Koliopoulos and Gerry Sutton

that data reliably. In addition, HSM performs its function by being aware of which files have been used recently and which have not. For this reason, you don't ever want anything on your system to destroy this information, or HSM will not operate correctly.

THE BASICS OF BACKUP

WITH HSM, FILES are migrated off the disk based upon some user-defined migration policy. Ordinary backup utilities travel up and down a filesystem and copy files to secondary storage. You could have a disaster on your hands if a "full" backup caused every migrated file to be pulled back in off of optical disk or tape, or worse yet, if the migrated file were located offline on a shelf somewhere. To solve this problem, many HSM vendors now provide a means by which migration/reload can be side-stepped. This can be solved with a special switch that only allows the backup routine to copy the stub file to tape or optical. This also can be accomplished with a special group whose processes see stub files for what they are, rather than the data "mirages" the rest of the system sees. This can also be accomplished by a wrapper routine that scans or "swathes" programs and prevents migrated files from being reloaded.

Some HSM software vendors address the issues of backup and lost

data by providing special local and client-server backup packages that can work with their HSM solutions. Still others solve this problem by making their HSM software compatible with a broad range of third-party backup packages. This is usually done by providing a framework which runs the third-party package so it doesn't destroy the vital information needed by the HSM system. Rather than locking you into just one backup solution, some of these vendors are now "open" enough so you can exploit the range of backup packages — thus giving you alternative strategies and greater flexibility.

MORE STORAGE THAN MEETS THE DISK

HSM SYSTEMS tend to impose additional storage overhead on files.

Although some vendors have reduced the amount of storage needed to run HSM, be prepared to face the fact that an HSM system that puts files on secondary storage may require additional storage for the following:

- An inode to track the migrated file
- A data block for file information
- A local database entry for additional information
- A database entry on the secondary storage system to track file location
- An inode on the secondary system for identifying the data file
- The data file itself

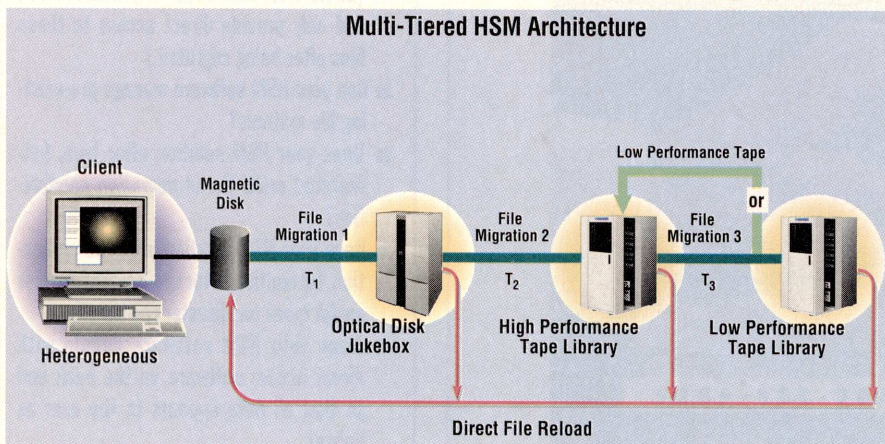


Figure 1: To exploit performance, your primary data migration might be from magnetic disk to optical disk. After a pre-determined period of time, direct access HSM software can migrate the data off optical disk and send it next to high performance tape. Later, as data ages, it is migrated from high-performance tape to high-capacity, low-performance tape.

*21 users need data.
That means
printing 93,109
pages of reports,
assembling and
delivering them by
2 o'clock.*



Or not.

VISTA Plus

VISTA Plus is the easy electronic report management solution that:

- ~ Provides common access to MPE and UNIX reports without application changes.
- ~ Users are up and running in no time.
- ~ Full Windows functionality.
- ~ Page content based security.
- ~ Allows timely decision making with fast, efficient data access.
- ~ Saves paper, resources and time.
- ~ Integrates with spreadsheets, word processors and other PC applications.

Phone: 714-720-1434, e-mail: info@quests.com.

All names are registered trademarks or trademarks of their owners.

**QUEST
SOFTWARE**
Expect a solution.

CIRCLE 462 ON READER CARD

Four of the top trading houses on Wall Street use MOUSE-TRAK.

Productivity and reliability persuaded these businesses to replace hundreds of free mice that came with their workstations with \$199 MOUSE-TRAK™ trackballs.

Productivity: Laboratory testing has shown that only 4 hours of continuous mouse usage can result in as much as 60% loss of hand strength. A trader in that condition is simply not going to make as many trades per hour in the second half of the day as in the first. The same tests show no signs of physical fatigue when using a MOUSE-TRAK.

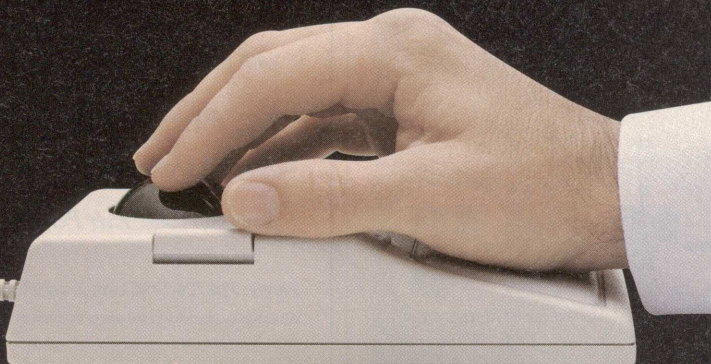
Reliability: MOUSE-TRAK's rugged construction results in *much* higher reliability than mice or consumer trackballs. MOUSE-TRAK doesn't take traders out of play or make support people pull their hair out!

Call today to order or receive a copy of our analysis of the benefits of a MOUSE-TRAK versus a free mouse.

1-800-533-4822
sales @ moustrak.com

mouse-trak

The Professional's Trackball



ORDER TOLL FREE 1-800-533-4822

ITAC Systems, Inc. 214 494-3073 Fax 214 494-4159
www.moustrak.com

MOUSE-TRAK is manufactured in the U.S.A. by ITAC Systems, Inc.,
3113 Benton Street, Garland, Texas 75042 Patented by ITAC Systems, Inc.
MOUSE-TRAK is a registered trademark of ITAC Systems, Inc. Other brand and
product names are trademarks of their respective holders.

CIRCLE 107 ON READER CARD

HSM

When considering an HSM solution, it's important to determine how much storage is used for migrated files and how much of your disk will be needed just to set up file migration. You also should determine whether there are functions on your system that could potentially defeat the data management

HSM Q&A

How do you rate HSM solutions? Simple. By getting a "yes" answer to the following questions:

- Will your HSM software coexist with and provide a seamless interface with other third-party backup software solutions?
- Can your HSM software be installed with little or no disruption to your main operating systems?
- Is file data available as it is migrated in, as opposed to waiting for the complete file to be resident on magnetic disk?
- Is it possible to determine if a file is resident or non-resident?
- Is it possible to manually migrate data in and out?
- Does the system support high and low watermarks for controlling available disk space?
- Will the system support pre-migrated files so their space can be freed up quickly?
- Will the system catch an "out of space" prompt or begin a "demand migration" prompt to create space instead of returning an error?
- Can you migrate files in both directions? (Some HSM solutions only migrate out and only provide direct access to those files after being migrated.)
- Can your HSM software manage pre-existing file systems?
- Does your HSM solution offer true, full-featured multi-tiered migration capabilities?
- Does your HSM solution offer file replication to multiple storage devices and/or media types for disaster recovery?
- Does your HSM software couple with direct access software on the back end so that all data appears to the user as online?
- Will your HSM solution enable sharing of storage resources in a heterogeneous environment? —G.S.

system. For example, when reading files, is there anything that could periodically sift through your system and cause all files to migrate back?

HSM: THE NEXT GENERATION

THANKS TO A new generation of HSM solutions from EMASS, IBM, Qstar and others the future of HSM is a bright one. Some are providing the features and functionality to deliver on the promise of *cost-effective, limitless data storage*. In the past, you may have had to dedicate a full-time staffperson (or persons) just to administer, manage and

With earlier HSM functionality, backup was time-consuming, tedious or even non-existent. Fortunately, some of today's new HSM software packages include file replication (see Figure 2).

Some HSM solutions now reside atop direct access software to provide true direct access to your secondary storage resources (see INsites, page 14). Most of the well-known operating systems can now share the data migration/recall and network storage loads for greater overall system efficiencies. This direct access/shared storage approach creates a more scalable system and one where additional capacity can be added in smaller, more cost-effective

increments.

In principle, HSM is a brilliant technique. HSM can help you coax gigabyte or even terabyte data capacities from magnetic disks with mere megabyte capacities. Rather than having to spend a bundle of cash on additional expensive magnetic disk storage to keep up with demand, you spend fewer dollars per gigabyte

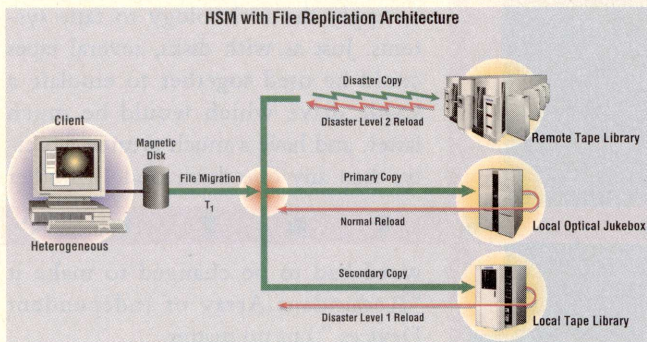


Figure 2: File replication allows you to replicate files and send them to multiple geographic locations across both LANs and WANs. In the case of a primary file failure, the replicated copies can be transparently retrieved. This new level of architectural robustness has helped elevate UNIX-based HSM as a viable recovery solution.

maintain an HSM system. If so, the new generation of HSM solutions has, in varying degrees, simplified the processes of implementation and operation.

Some packages now provide full file, volume, drive, jukebox and tape library management, as well as the tools needed to control, configure, and monitor optical jukeboxes and tape libraries. And a number of user-friendly GUI interfaces provide easy system setup, configuration file editing, automatic and manual migration, and GUI-assisted retrievals. With some of today's HSM solutions, system administrators can simply install, configure and then walk away to take on more pressing data management issues.

Today's HSM solutions have evolved to a new level of data storage management sophistication too. Now there is full-featured, multi-tiered file migration for clients as well as servers (see Figure 1).

on secondary storage like an optical jukebox or magnetic tape library. Your least-used files are sent off to this lower-cost storage so that file space can grow, files can get bigger and there can be more of them on your primary storage. And on the horizon, a new generation of HSM solutions offer new ways to keep its original promises from being broken. Dust off the pedestal. —Pete Koliopoulos is director of new business development at EMASS Inc. (Englewood, Colo.). Gerry Sutton is senior marketing communications specialist with EMASS.

Would you like to continue to see articles on this topic?
Circle on reader card
yes 348 no 347

*To share printers,
you could do
complex spooling
and spend a
fortune on
implementation
and training.*



Or not.

NBSpool

NBSpool is a high-performance HP 3000 print spool management solution that:

- ~ Empowers your users to select the right printer for the right job.
- ~ Provides transparent printer connectivity across MPE, Windows NT, UNIX, IBM, VAX, NetWare, LAN Manager, Banyan Vines and more.
- ~ Eliminates lost reports and facilitates information routing.
- ~ Provides an intuitive user interface that accelerates implementation and lowers training costs.

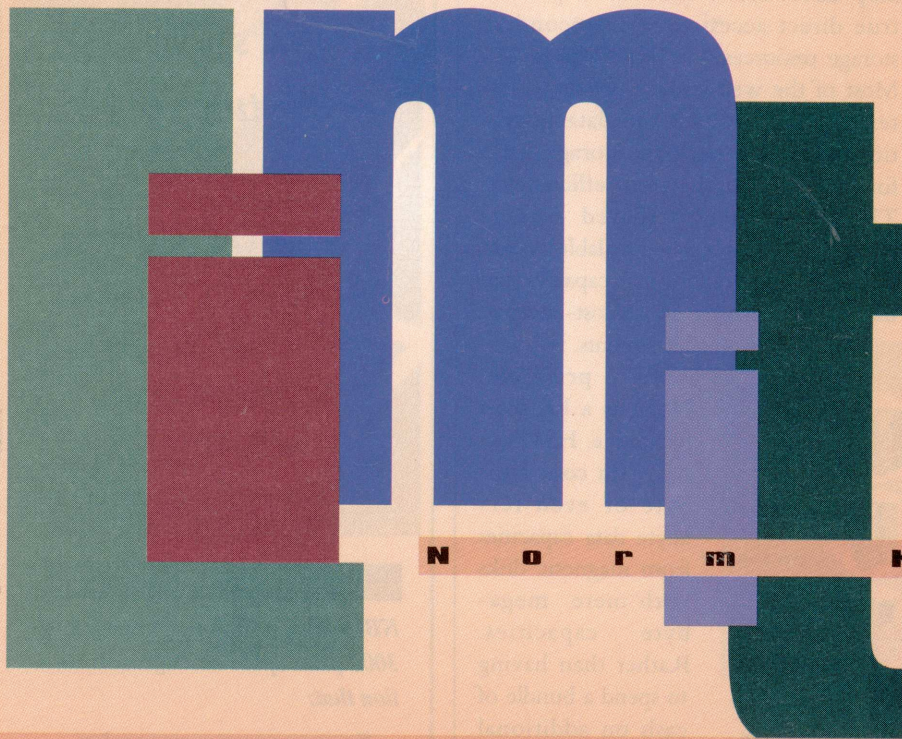
Phone: 714-720-1434, e-mail: info@quests.com.
All names are registered trademarks or trademarks of their owners.

**QUEST
SOFTWARE**
Expect a solution.

CIRCLE 175 ON READER CARD

Tape It

T O T h e



It quickly became apparent that the idea was too good to waste on poor disk systems. If RAID could make several poorer disks look like one super disk, what could it do if you used it on several super disks? So the application, and the words in the acronym now became “Redundant Array of Independent Disks.”

In the 1990s, several vendors began to apply the technology to tape systems. Just as with disks, several tapes could be used together to emulate a single drive which would be much faster, and have a much greater capacity, than any one drive alone. Another

word had to be changed to make it “Redundant Array of Independent Devices,” but no matter.

Those first generation tape RAID systems entered the market without

RAID was one of those concepts that was too good to leave alone. Invented in the 1980s as a means to allow several lower-performance disks to take the place of one high-performance model, its acronym originally stood for “Redundant Array of Inexpensive Disks.”

making too great a splash. That was largely because they didn’t outperform single tape devices by as great a margin as was experienced with disks. But that’s changing. New tape RAID architectures and new silicon are launching a second generation of tape RAID. These new systems are capable of performing reliable backup of very large files at very high speed, capturing data at very high rates or spinning off multiple backup copies in the time usually required to do just one. The larger your files and the faster or more frequently you need to save them, the

more you'll appreciate this new generation of tools.

IF IT'S NOT A DISK, CAN IT STILL BE RAID?

DISK RAID systems gain an advantage over single disks by writing or reading from several drives simultaneously or almost simultaneously. The overlapping or interleaving takes one of two forms: striping or mirroring.

In the highest throughput form of disk striping, byte one of data goes to track one/drive one, byte two to track one/drive two, byte three to track one/drive three. Three or more drives are written in rapid succession, and the result is the same as if there were only one drive which happened to be three or more times as fast.

The same can be accomplished with tape RAID. Three or four or more tapes can be written almost simultaneously, just as if there were only one, very fast tape drive.

Mirroring is like a special case of striping. The difference is that the same data is written to all of the drives simultaneously. In disk systems, usually only two copies are made, and both remain online — one as backup for the other. With tape, two or more copies can be made. One might go to a local vault, while the other goes to an offsite disaster recovery center. It would be unusual for either of them to stay online. Both mirroring and striping work well with tape media. It may not be disk, but it's still RAID.

WHO NEEDS IT?

WHO NEEDS tape RAID? Banks and financial institutions, brokerages, medical facilities, insurance firms, title insurance firms, government agencies, shippers, airlines and reservation systems. More and more users seem to have larger and larger files. The club of users with a terabyte (a trillion bytes) of data on file is still somewhat exclusive, but growing fast.

All that data has to be backed up. Some of it has to be backed up every

night. And in worst case scenarios — banks, for instance — users may need more than one copy. The storage medium must be not only fast enough to take all the data overnight, but also must provide fault tolerance.

Mirroring allows a user to make two copies of their backup in the same amount of time it would take to make one copy; that is, in half the time it would take to make two copies. One West Coast-based financial institution uses paired mirroring to make the time even shorter. It feeds two job streams (backup for two different files) to an array of four tape drives, and makes two copies of two files simultaneously. Modern tape RAID hardware allows for running all four tapes at full speed, in this case, Quantum DLT4000s which have a recording speed of 1.5 MBps each, uncompressed (3.0 MBps with data compression.)

And backup's not the only reason for speed. Geologists, engineers and NASA scientists sometimes get only one try to record as much data as quickly as they can. Faster is better for them, too.

One oil exploration company uses a ship-based tape RAID system for high-speed recording of seismic and other data. In their case, they produce two data copies simultaneously and automatically switch to two other drives in the array when the first two cartridges are full. The drives are IBM 3480-type, which record at an impressive 3 MBps each (uncompressed), but fill up fast.

Then there's the major entertainment company that makes CD-ROMs for games. They have to back up over 800 GB of data spread over several servers. To do it, they use striping over five drives (four plus parity) for maximum speed, and include automatic tape stackers to make it all automatic.

WHY TAPE RAID IS HOT NOW

In 1995, some new tape RAID systems began to hit the market. They were a great improvement over what had come before. The greatest changes seen were in controller electronics

*To use NFS, you
could dump all
your HP 3000s,
set up a new
network, and
retrain all your
MIS staff.*



Or not.

NFS/iX

NFS/iX is a high-performance implementation of NFS for the HP 3000 that:

- ~ Provides industry-standard, transparent interoperability on heterogeneous networks.*
- ~ Eliminates lengthy, time-consuming file transfers.*
- ~ Lets the HP 3000 operate as a high-performance file server.*
- ~ Allows centralized management of diskless clients for improved security and backups.*
- ~ Facilitates workgroup development and client/server deployment.*

Phone: 714-720-1434, e-mail: info@quests.com.

All names are registered trademarks or trademarks of their owners.

**QUEST
SOFTWARE**
Expect a solution.

CIRCLE 481 ON READER CARD



I wake up and technology's different.

Our platforms are **changing**.

We're adding systems.

And our DR plan's left with
some **big gaping holes**.

We need a company that can **keep up**
with it all.

We need to be covered.

That means everything.

You think you have a solid DR plan. But changing technology has a way of making plans look like Swiss cheese overnight. You need SunGard to fill in the gaps.

We cover it all, because we support every major platform. IBM & Unisys. Tandem & Stratus. DEC & HP. Sun, AS/400 & System 3x. RS6000 & NCR. And LANs & WANs. Virtually any piece of equipment for total peace of mind. All backed by planning and support experts that handle the headaches for you.

And let's face it. Things change. So SunGard lets you swap, upgrade or change your back-up configurations as your needs evolve. For ultimate flexibility.

Let us map out your comprehensive plan. Call **1-800-247-7832**.

Because if you're not covered, we have one piece of advice. Take cover.

SUNGARD®



The Disaster Recovery Experts

CIRCLE 165 ON READER CARD

RAID

where Digital Signal Processors (DSP) and purpose-specific chips replaced more mundane general-purpose processors, and in array architecture.

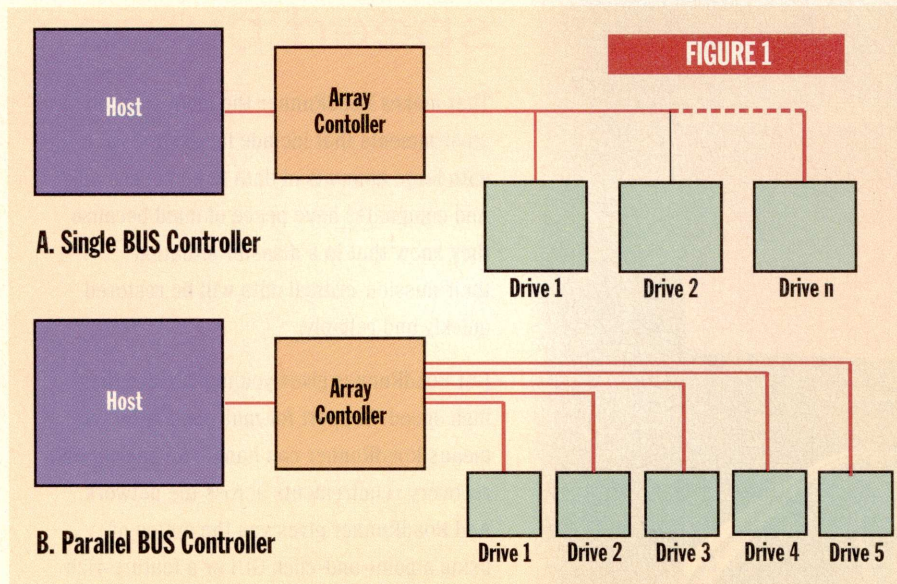
First generation tape array systems were built around a shared bus architecture, and that bus was usually a 10 MBps SCSI. While it was possible to overlap multiple read or write operations, the degree of parallelism was not impressive. Designing for larger data transfers led to idle tapes waiting for data, and designing for shorter transfers led to unacceptable bus contention.

Newer designs feature independent

tape array can operate at an effective speed that is 400 percent that of a single drive. The host system may not be fast enough to keep the tapes running full-speed, and the backup software can cause delay, as can the data itself, but if 400 percent is difficult to achieve, 300 percent is a realizable number.

WHAT DOES IT TAKE?

TAPE RAID IS a hardware and software solution. You need a RAID tape array, plus backup software, and a host



First-generation tape RAID arrays used shared-bus architectures that led to mediocre performance, especially in striping operations. Newer controllers have an independent bus for each drive, a higher speed link to the host and electronics that are fast enough to allow for byte striping.

buses between the controller and each drive, which eliminates much bus contention (see Figure 1). "Fast and wide" 20 MBps buses are used between the controller and host, giving the drives somewhat more room to breathe. And the degree of parallelism, the amount of the time that multiple drives are operating simultaneously, has been greatly improved by reducing the data interleave size to as small as a byte — which now can be done thanks to the faster DSP-based electronics.

As a result, today's newest tape RAID systems can deliver several times the performance of a single drive. For example, a well designed

that's fast enough to drive the array at a meaningful speed. You do not need a special version of the backup software or special peripheral drivers.

One of the big advantages of basing a tape RAID system on a SCSI interface is that it can all be made transparent to the host. As far as the host is concerned, the array looks and operates like a single drive. If the host is an HP 9000, and the HP 9000 has what it takes to write a single Quantum DLT4000 tape drive, the array controller can make a set of three, four or five DLT4000s look like one.

Are there some fussy little fixes that might have to be made? Often not.

To protect your data, you could back-up hourly, buy a fire-proof safe, and a \$5 million insurance policy.



Or not.

NetBase

NetBase is a comprehensive disaster recovery and clustering solution that:

- ~ Creates a fault-tolerant network integrating MPE, UNIX and desktop systems.
- ~ Improves performance and maximizes system availability.
- ~ Optimizes workloads by distributing processes and data on the network.
- ~ Provides industrial strength disaster tolerance without the need to change applications.
- ~ Improves system management through file and user statistics for any node.
- ~ Protects investments by allowing modular growth.

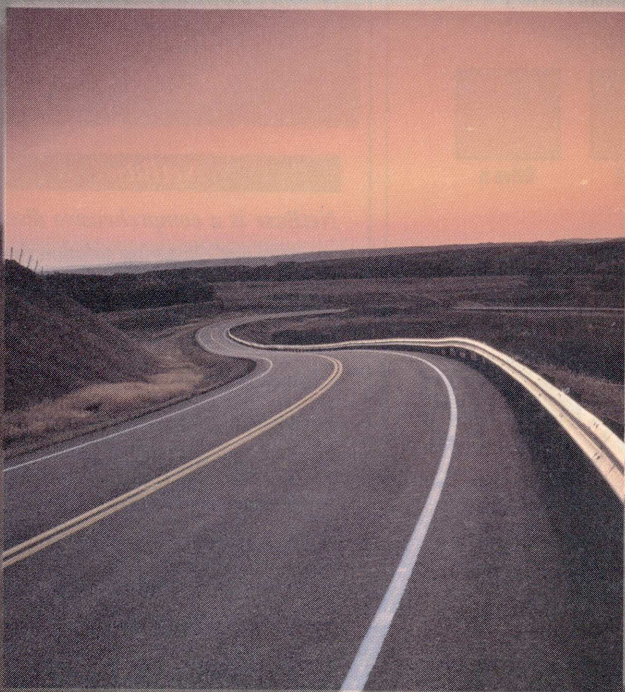
Phone: 714-720-1434, e-mail: info@quests.com.

All names are registered trademarks or trademarks of their owners.

QUEST SOFTWARE
Expect a solution.

With Unison RoadRunner

your UNIX backups won't encounter any
speed bumps



That's because Unison RoadRunner is the fastest and most reliable backup product you can buy for your UNIX systems. It provides high-speed, high-compression store and restore, with speeds of more than 60 gigabytes per hour on parallel drives.

That makes RoadRunner the ideal solution for environments that include large servers with large amounts of data to be backed up. And companies have peace of mind because they know that in a disaster situation their mission-critical data will be restored quickly and reliably.

But RoadRunner gives you much more than high speed. Support for multiple platforms means RoadRunner can handle all backup and recovery requirements across the network. And RoadRunner gives you the option of using a point-and-click GUI or a feature-rich command-line interface.

There's a lot more. A state-of-the-art catalog management system. Extensive device support. On-line backup of Oracle and Sybase databases. Integration with HP's Operations-Center. You can even custom-tune certain backup parameters to achieve optimal performance.

Whichever way you run it, RoadRunner gives you the record-setting performance that sets it apart from all competitors. See for yourself. Call us today at **1-800/298-4149** for more information.

Unison Software

5101 Patrick Henry Dr., Santa Clara, CA 95054

Phone 1-800/298-4149, Fax 408/988-2236

Web Site <http://www.unison.com>

CIRCLE 499 ON READER CARD

RAID



Tapes are already capable of 20 GB capacities (uncompressed) and transfer rates in the range of 10 MBps; they'll soon go to 50 GB and 15 MBps.

Does your Novell image-backup software demand to be assured that your DLT4000 has adequate capacity before it will transmit a 100 GB file? You'll need to tell it that your "tape" has plenty of space, and that's a one-time fix.

Tape array hardware is available from Andataco (San Diego, Calif.), CoComp (Fort Collins, Colo.), LAND-5 (San Diego, Calif.), Symbios Logic (Fort Collins, Colo.), Trimm

U.K. (Nottingham, United Kingdom) and Virtual Technology (Rochester Hills, Mich.), among others. Their choices of drives will differ depending on which drive manufacturers each represents. Fortunately, however, the number of vendors is large enough that users should be able to find one which offers their favorite medium (4mm, 8mm, 3480/3490 or DLT) and brand.

Well-known backup software is available from Arcada (Lake Mary, Fla.),

Cheyenne (Roslyn Heights, N.Y.), Legato (Palo Alto, Calif.), Palindrome (Naperville, Ill.) and others. And skeptics, who think the software won't be able to keep up with the tapes, should check out AT&T's blindingly fast new NetVault; it only works on UNIX systems for now, but give them a chance.

IS THAT ALL?

MORE IS ALWAYS on the way. As far as the controllers are concerned, 40 MBps Ultra SCSI is just over the horizon. Tapes are already capable of 20 GB capacities (uncompressed) and transfer rates in the range of 10 MBps; they'll soon go to 50 GB and 15 MBps. Need even more? Watch for today's tape RAID arrays to be used in tape libraries (they already know the stacker commands).

And will you still need tape RAID when faster drives come out? You will if you want fault tolerance or to go faster than one drive can go or to make more than one copy at a time — which were the reasons for RAID in the first place, remember? — Norm Kiefer is the product manager for Ultera Systems (Laguna Hills, Calif.) a manufacturer of tape and CD-R components.

Would you like to continue to see articles on this topic?

Circle on reader card
yes 350 no 349

*For client/server
computing,
hire a staff of 50,
spend \$1 million,
and rewrite all
your legacy
applications.*



Or not.

NetBase® Client

NetBase Client is a simple, straightforward client/server solution that:

- ~ Provides access to HP 3000 MPE or KSAM files and TurboIMAGE from UNIX, DOS and Windows.
- ~ Makes existing legacy data accessible from PC and UNIX applications without remote logons, expensive HP user licenses or unnecessary application changes.
- ~ Can be quickly and inexpensively implemented in a tightly-integrated HP 3000 environment.

Phone: 714-720-1434, e-mail: info@quests.com.

All names are registered trademarks or trademarks of their owners.

**QUEST
SOFTWARE**
Expect a solution.

CIRCLE 269 ON READER CARD

How BIG is a terabyte?

Enough to store 250 byte profiles like this one below on 4 billion people, roughly the entire population of the earth. And you have to finish your backup by when?

John William McLaughlin
3151 Airway Avenue, Apt F204
Costa Mesa, California 92626 USA
Born 07/09/42 Chicago, Illinois
185 cm, 79.0 Kg., unmarried, 2 dep
Educ: 16 years, B.A. Engl
SSN 990-00-1234 CDL A01234567
Prod foreman, Madeshift Enter.
Torrance, California

Client-server is a competitive weapon that can allow companies to improve customer satisfaction, reduce time-to-market and increase productivity, if implemented and used correctly. However, from the beginning of the transition project, it is vital to focus on the expected business benefits and understand the business goals of the planned transition to client-server.

Guy Wood, managing director of IT for United Grain Growers (UGG; Winnipeg, Manitoba) contracted with HP's Professional Services Organization (PSO) to help him lead his 60-strong IT team through a transition from an IBM mainframe to a new client-server-supporting HP platform. "We recognized that transitioning to a new client-server environment would dramatically reduce our IT costs in the future. In fact, the transition is now saving UGG \$1 billion per year," he maintains.

While cost savings were an important benefit of the transition, other

business objectives were identified. "We wanted our new system to deliver improved functionality during a time of corporate change. UGG was going public, and our industry was deregulating; this meant that the UGG staff needed access to information quickly and easily. Our old mainframe was inadequate, because the process of getting information stored electronically was unfriendly and tedious. This had to change," says Wood.

A Smooth Transition

EVALUATING ALTERNATIVES

ONCE THE business needs driving the transition have been identified and analyzed against the current environment, the various IT alterna-

tives need to be evaluated and compared. Some of the questions which should be asked are:

- What IT investments can be preserved in the new client-server environment?
- What criteria determine which application should be migrated?
- Can the transition be accomplished in a timely and cost-effective manner?
- Do we have the internal expertise required to be successful?

"Transition recommendations may include re-hosting, replacing, re-architecting, surrounding or even outsourcing the existing IT environment," says Jeff Louie of HP's PSO. "The issues, benefits and risks associated with each option need to be objectively quantified."

The surround strategy combines a number of techniques that enhance the "value" of existing legacy functions and data. New applications may be developed and integrated with legacy systems and data residing on the mainframe. An example would be a new customer service application with a GUI and local processing on a client workstation integrated with existing legacy data.

Re-architecting also is popular, perhaps as a result of business process

re-engineering projects and the subsequent need to match technology solutions to new and revised business functions. One technique involves re-engineering existing application functions that do not effectively support the business to a distributed client-server environment using new technologies such as objects.

A re-hosting strategy is usually undertaken to achieve tactical objectives such as cost maintenance, mainframe upgrade avoidance and corporate restructuring. Re-hosting provides the same application on multiple platforms while maintaining exact functionality. It requires less end-user training and protects existing investments in software and people.

The re-host option was the one chosen by UGG. "We wanted to move to a new platform that supported client-server, batch and online processing as we saw benefits in each," says Wood. "Re-hosting was our best option, and we focused on completing that project as quickly as possible and avoided becoming side-tracked by other projects. Our strategy was to move on after that project to work on new ideas aimed at exploiting the new environment."

EDUCATION

THE TRANSITION to the new solution architecture will require a new set of technical and personal skills to support the implementation. Within the organization, the current level of skill needs to be profiled, the skills gap identified and training programs initiated. By attending to personal skills, such as communication, analytical and team-building skills, the company will help facilitate successful working relationships within and between IT and business units. This is critical for a successful transition to the new organization and environment.

"Our experience has shown that the greatest challenges in a transition are related to people rather than technology," said Morris Wallack, education manager at HP's PSO. "The goal is to reduce resistance to change, increase support for the new solution

and remove employee doubts about the technology and their role in the new environment. With the right management sponsorship and education, the entire organization will support the transition with enthusiasm, motivation and effective actions."

Wood recognized that he and his staff needed help making the transition to the HP platform and UNIX operating system. "Our IT staff has been working in a mainframe environment, and some initially resisted the change. We worked with HP's Professional Services Organization and application vendors to retrain our staff in a sensitive and structured way. We had good IT people and we wanted to bring them with us into the new environment by giving them the training they needed."

THE RISK

BOTH THE BUSINESS and operational risks that could significantly impact the transition should be identified. A business risk can manifest itself in the form of strategic, political or environmental issues associated with any IT project. Business risks also can be associated with economic and competitive factors that may have a negative impact on the outcome of the project. Operational risks can be defined as those risks that have a relatively known level of uncertainty, are quantifiable and are basically internal to the project (i.e., cost, schedule, personnel, equipment and technology).

Technical risks may include an inadequate definition of requirements, a reliance on immature technology, poor estimates or insufficient skills.

The cost analysis considers all component costs required to implement the entire transition strategy and documents any assumptions for those components that cannot be quantified at the time of the analysis.

Some of the major cost components of transitioning to open systems are:

- Systems and networking
- Support
- Education and Training
- Project implementation costs
- Development system costs

*You could shop
around endlessly
to solve all your
networking
and output
management
needs.*



Or not.

Quest Product Family

Our complete family of HP networking and output management solutions means one-stop shopping:

- ~ *VISTA Plus, the easy-to-use electronic report management solution.*
- ~ *NBSpool, the high-performance spool management solution.*
- ~ *NFS/iX (Client and Server), the only NFS for MPE XL and POSIX.*
- ~ *NetBase, the comprehensive clustering and disaster recovery solution.*
- ~ *NetBase Client, straightforward access to MPE data from UNIX and LANs.*
- ~ *EnterPrint™, a robust and scaleable server for Xerox production printers on TCP/IP networks.*
- ~ *QUARK Plus, the multi-platform compression solution.*



Phone: 714-720-1434, e-mail: info@quests.com.

All names are registered trademarks or trademarks of their owners.

**QUEST
SOFTWARE**
Expect a solution.

CIRCLE 268 ON READER CARD

APRIL 1996 29

OUR 15th YEAR

QUALITY HP WORKSTATIONS - WITHOUT THE HP PRICE

RENT • LEASE • BUY

Immediate Delivery On Most Items

QUALITY MAINTENANCE FOR HP WORKSTATIONS

Ask About Our RAPID REPLACEMENT Low Cost
Maintenance Programs Which Include On-Site Spares

- 700 SERIES: All Models
- X-STATIONS: ENVIZEX, C270X
- All 300, 400T and 400E Series
- Memory, Features & Disc Upgrades for all Workstations
- CPU Upgrades: All Models

*More Than 1500 Satisfied Customers
Throughout The USA and Worldwide*

For technical info, specs or pricing
call Mordy or Carol



C.S.U. Industries, Inc.

395 Pearsall Avenue, Cedarhurst, NY 11516
(516) 239-4310 FAX (516) 239-8374

CIRCLE 213 ON READER CARD

BIG on Power.

ERICOM SOFTWARE'S

PowerTerm

INTER-CONNECT SERIES

**The most powerful PC terminal emulator
At the lowest price.**

- Lots of terminal types for UNIX, VMS, AS/400 & IBM Mainframes.
- VT420, WYSE 60, DG, SCO, 3270, 5250 and more.
- File transfer, scripting, API and more.
- 32-bit NT & 95 versions – DOS too!
- Includes Newt TCP/IP stack.
- FREE copy on the Web at:
http://www.unipress.com/free_evals



800-222-0550 • 908-287-2100

2025 Lincoln Highway • Edison, NJ 08817

<http://www.unipress.com> • info@unipress.com

All trademarks acknowledged.

CIRCLE 138 ON READER CARD

Before full implementation and deployment begin, some companies implement a pilot project at a single site or from a specific workgroup. This can be helpful in designing, programming and testing communications and prototype applications, as well as in creating operational guidelines.

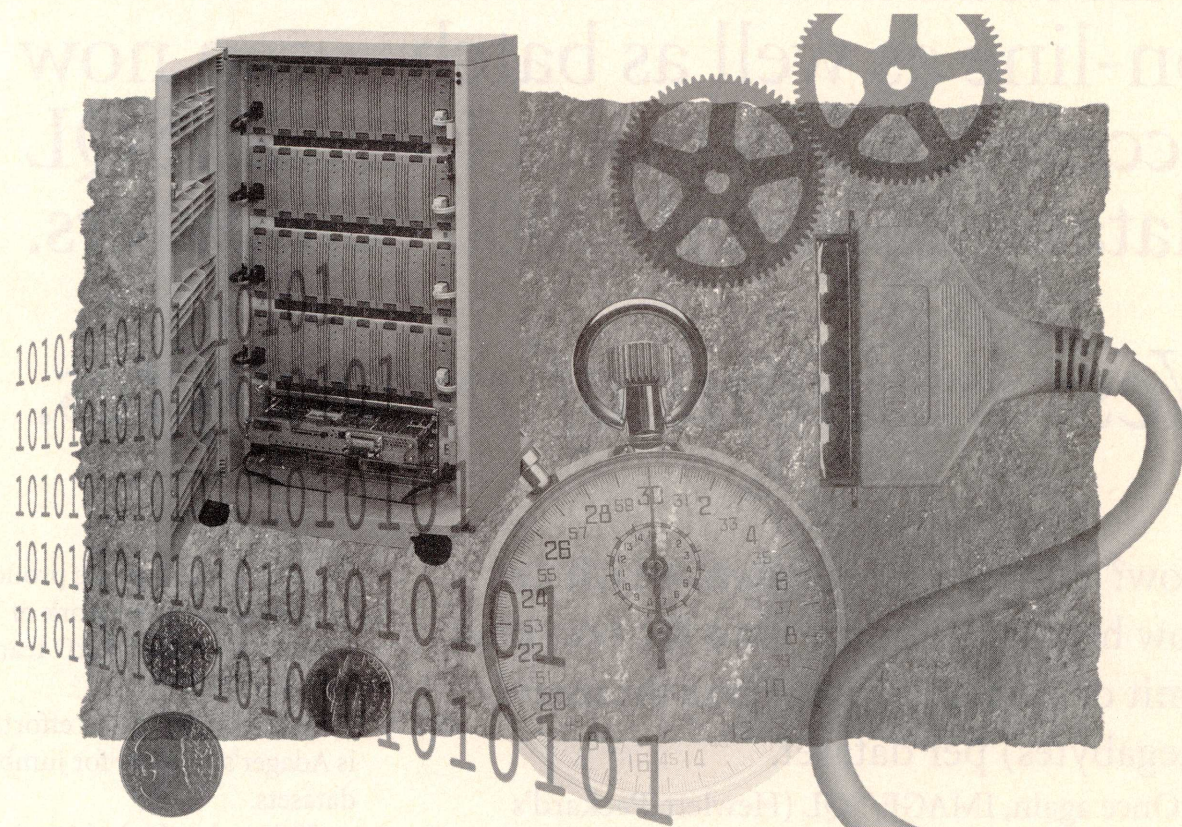
OUTSOURCING

RATHER THAN manage the transition and new computing environment internally, some organizations prefer to outsource the challenge to a third party. Outsourcing allows organizations to remain focused on their core business challenges without becoming side-tracked by a large-scale transition project and system management issues.

Some companies may be uncomfortable relinquishing entire control of technology when it is recognized as such a key business enabler. "A popular approach is to selectively outsource only certain operations. This philosophy of combining internal and external resources helps customers focus on their core competencies while employing outside technical expertise to manage other functions," said Joel Gerston of HP's Worldwide Customer Support Operations.

In the final planning step, review the transition approaches and create a high-level timeline to identify the major milestones and relative time frames for various aspects of the overall transition project. Relationships and dependencies that are critical to the overall success of the transition project should be considered. Organize and depict parallel activities where appropriate, attaching relative priorities based on overall requirements, application strategy, and product and solution availability. Working with internal staff, external consultants and third parties, develop an estimate of the time required for each component of the transition plan. — *A special report compiled from HP's PSO.*

More of Everything You Want In a NFS File Server for Less



Take a closer look at MDL's Peak TriadServer™ and you'll discover it's the most reliable, fastest RAID solution you can buy at a price lower than other comparable servers.

Reliability: Proven open systems architecture allows maximum uptime for secure data redundancy.

Speed: At 4,350 I/Os per second for each controller and a host transfer speed of 20 MB per second, there's nothing faster than a Digital StorageWorks 410.

Accessibility: Take advantage of high-performance, Intel-based processors with MDL's enhanced network file server language. Or use the Peak TriadServer with your existing environments including HP-UX, AIX, SunOS, Solaris and Digital.

Affordability: With all due respect to our competition, we can save you more than 50% compared to some brands. Even though the Peak TriadServer is very affordable and saves system administration time, you won't have to give up capacity (up to 96 GB), non-proprietary architecture, modularity and more.

Protect your company's critical data with products from a company you've grown to trust. Depend on MDL Corporation for mass storage, archival backup solutions and performance technology.

Contact us today for more information about our affordable, high-performance Peak TriadServer.



(800) 800-3766

Outside U.S., call (206) 861-6700

<http://www.mdlcorp.com/mdlcorp/welcome.html>

e-mail: sales@mdlcorp.com

All brand, company and product names are trademarks or registered trademarks of their respective companies.

CIRCLE 168 ON READER CARD

StorageWorks



Thousands of concurrent users—
on-line as well as batch—can now
access *terabytes* with IMAGE/SQL
databases on HP 3000 computers.

Yes: millions of megabytes.

How? With *Jumbo Datasets*, which can
now hold much more than the previous
limit of four gigabytes (four thousand
megabytes) per dataset.

Once again, IMAGE/SQL (Hewlett-Packard's
award-winning database management system) leads
the way with the open Posix capabilities of MPE/iX on
the high-availability (and fast) RISC HP 3000.

Sheer, massive quantities are not enough, though.
With IMAGE/SQL, you also get day-to-day reliability.
And you do not have to pay a king's ransom just to
barely keep up with the needs of your business. You do
not have to spend your time and attention constantly
fiddling with your computer system. And you enjoy
rock-solid stability from one version to the next.

Thanks to Hewlett-Packard, *you* get all of this—and more—
with its IMAGE/SQL DBMS. Pity your friends who are forced
by peer pressure (or by ill-advised management directives) to
waste their lives fighting with mediocre (but hyped-up) data-
base servers, operating systems, and hardware.

At Adager, we are proud
to complement the work of
Hewlett-Packard's R&D team
for IMAGE/SQL.

An example of our efforts
is Adager's support for jumbo
datasets.

This technological feat is
nice, of course. But the true
beauty of Adager's approach
is that, by design, it is 100%
transparent.

There is nothing special
for you to do. Adager takes
care of all the nitty-gritty
operating-system bits and
bytes on your behalf.

As you would expect from
us, Adager does not charge
you extra for jumbo-dataset
support. We don't do tier
pricing either.

We are here to help you in
a big way, not to cause you a
massive heart attack with
unreasonable prices.



The Adapter/Manager for IMAGE/SQL databases

Adager Corporation • Sun Valley, Idaho 83353-3000 • USA
Internet: support@adager.com • Telephone (208) 726-9100 • Fax (208) 726-8191
Toll-free from North America: (800) 533-7346 • Fax (800) 247-7346



PCs may be proliferating on the desktop, but many organizations cannot afford a wholesale replacement of their host-based computer configurations. For many years, terminal emulation has provided a link between the desktop and corporate information.

Most terminal emulation vendors now refer to their products as host-connectivity software. And indeed, today's emulation software goes beyond the terminal to integrate data from multiple systems and database platforms with Windows-based desktop applications.

PC-to-host communications in the HP market is a "one vendor market. And that one vendor is WRQ," says Elisabeth Rainge, PC connectivity analyst at International Data Corp. (IDC; Framingham, Mass.). Rainge contends that HP terminal emulation has become a commodity market, because you can almost use any UNIX emulator for connectivity to HP 9000 hosts.

While some industry analysts share Rainge's opinion, connectivity vendors such as WRQ (Seattle, Wash.) and Attachmate Corp. (Bellevue, Wash.) see a different picture. WRQ and Attachmate point to a loyal installed base of HP 3000 system managers who need host communications software to run their applications for machines such as the old superset terminal HP 700/98 to HP hosts. "The HP market for terminal emulation is anything but dead," explains Paulo S. Chow, product engineer and director of Attachmate's Product Management Open Systems Product Group. "While it is true that the HP 9000 server is a UNIX box — so any number of generic terminals, including VT, can access it — many HP

3000 systems who have moved their applications to the 9000 Series still continue to use their old terminal interface."

According to Linda Merrick, WRQ's HP product manager, "The 3000 community is an incredibly loyal bunch. They'll be around for a while. And, HP has a strong VAR channel that develops apps for the 3000."

EMULATION AS YOU KNOW IT

IN THE PAST few years, many terminal emulation vendors have significantly enhanced their products, fueled by an increasing number of computer sites hoping to integrate workgroup computing, videoconferencing, imaging and other capabilities into their business environment.

Emulation vendors will continue to focus on emulation quality and provide features to increase usability. Many vendors have introduced OLE compliance and product suites — connectivity software that integrates

End Of The Line For Terminal Emulation?

Donna Gasiewski

With the advent of the client-server paradigm, you might expect to find terminal emulation on the endangered technology list. But emulation remains a straightforward solution that allows IS managers to retain their investment in centralized information systems.

CONNECTIVITY COMPARED

Host-connectivity products are built on the foundation of terminal emulation, and the industry's leading vendors provide about the same basic functionality. The differentiation is in the details. What value-added features does each offer? Is the software modular so I can purchase only what I need? What comes bundled and what do I have to pay extra for? The following is a comparison of eight HP-based host connectivity products, based on information provided by the vendors. Note that while most vendors offer a range of software, we focus on only the flagship product.

KEA! 420 for VAX/UNIX **KEA! 340 for VAX/UNIX** **Base price: \$245 and \$395, respectively**

Attachmate Corp.
(206) 644-4010
<http://www.attachmate.com>

Circle 340 on reader card

The KEA! family from Attachmate Corp. (Bellevue, Wash.) includes KEA! 420 for VAX/UNIX and KEA! 340 for VAX/UNIX, which respectively provide VT420/340 and VT340 emulation for Windows, Windows NT and Windows 95 to VAX and UNIX systems, including HP-UX and Digital UNIX. KEA! for VAX/UNIX includes the proprietary Attachmate Enterprise Access Library API set for integrating host information into front ends built with Visual Basic and PowerBuilder, among other development environments. Attachmate's Tools! for Visual Basic and Tools! for PowerBuilder cost \$195 each. Visual Basic calls can be generated to KEA! with Attachmate's QuickApp development tool, which helps you build front-end applications without writing code — an alternative navigation tool from OLE Automation. KEA! features custom menus, dialog boxes, button pads, a macro language, toolbars, keyboard mapping and help.

Connectivity includes integrated ftp; NetWare for DEC Access, with non-TSR-based multiplexing of sessions; and NetWare Connect support through Novell's NASI.DLL. KEA! for VAX/UNIX supports TCP/IP, LAT and IPX through Attachmate's Link TCP/IP kernel, which comes bundled with KEA! products, and through support for NetWare for DEC Access and Firefox NOV*ix. Licensed technical support for KEA! costs up to \$1,200.

PowerVT for Windows **Base price: \$69**

Dart Communications Inc.
(315) 655-1024
<http://www.dart.com>

Circle 346 on reader card

PowerVT Advanced VT Emulation Package for Windows from Dart Communications Inc. (Cazenovia, N.Y.) provides VT52/100/220 emulation to HP 3000, HP 9000, VAX and IBM systems, as well as HP-UX, Digital UNIX and RS/6000. The MDI interface provides multiple concurrent session on the desktop, using Telnet, modem and direct connections over network and COM ports.

With PowerVT, users can customize configuration settings for each session, with options for color, fonts, row size, scroll-back buffer size, key remapping and programmable keys. PowerVT supports autoprint, printer controller, print page and cut-and-past features.

The single-purpose product runs on any WinSock-compliant system and is built on Dart's PowerTCP line of protocol libraries. With PowerTCP Protocol Libraries for Windows — which supports Microsoft C++, DLLs, Visual Basic and native Delphi versions — developers can write custom networking applications without writing socket library code. TCP, Telnet, ftp, RSH, RLOGIN, REXEC, SMTP, UDP and SNMP protocols are supported.

Corporate licenses for more than 150 users is \$20 per station. End-user and OEM licensing options also are available. Technical support is available.

DynaComm For Windows V3.2 **Base price: \$279**

FutureSoft Engineering Inc.
(713) 496-9400
<http://www.fse.com>

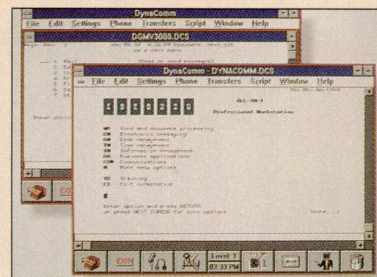
Circle 345 on reader card

The DynaComm family from FutureSoft Engineering Inc. (Houston, Texas) includes DynaComm V3.2 for Windows. Version 3.2 supports HP 700/94 emulation as well as VT340 with ReGIS graphics and VT52/100/220 emulations. It supports HP 3000, HP 9000, Digital, IBM and Data General Dasher systems, among others. Version 3.2's scripting language contains more than 350 commands and functions and allows automated sessions with remote systems. It supports real numbers, floating-point math, parameter passing, 192 variables and indirect variable referencing.

With DynaComm Toolkit for Visual Basic, an optional package costing \$195, you can write custom Windows front ends using Visual Basic. A dialog editor lets you create front ends for host applications with graphical tools, as well as interpret and create the script code necessary to duplicate the design. Interface features include file transfer, automatic dialing from directories, keyboard remapping, a toolbar editor and drag-and-drop file handling.

DynaComm supports TCP/IP utilities such as PING and STP from such vendors as Novell, NetManage and FTP software. Users also have access to communications interfaces for modem or RS-232, ComBIOS, NASI/NCI, Sun PC-NFS, WinSock V1.1, LAT and Pathworks.

Technical support is included with the cost of any DynaComm product.

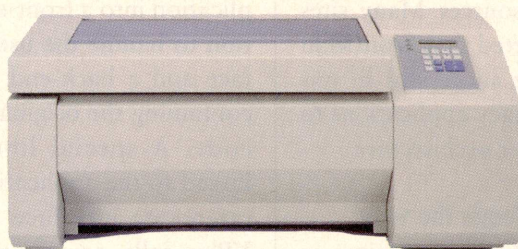


DynaComm V3.2 for Windows supports HP 700/94, as well as VT340 with ReGIS graphics and VT52/100/220 emulation.

ANNOUNCING THE MOST RELIABLE, HIGHEST-PERFORMING, INVOICE HANDLING, BAR CODE PRINTING, DATA PROCESSING, WITH THE LOWEST COST OF OWNERSHIP IN ITS CLASS, LINE IMPACT PRINTER FROM TALLY!

T6045
line impact
matrix
printer

**under
\$4,500!**

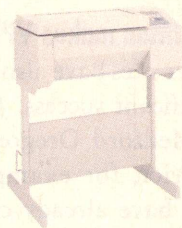


November 7, 1995
Mannesmann Tally T6045

The T6045 is an entry level line impact matrix printer that's short in cost-but not in performance. From general data processing to bar codes & other industrial graphics, the T6045 can print up to 450 lines per minute, and can handle a 80,000 pages a month with ease.



Versatility is the T6045's middle name. It comes equipped with



three industrial graphics languages standard plus POSTNET, giving you a variety of options for graphics handling. And, with a standard parallel & serial I/O or optional Twinax/Coax

interface, most network setups aren't a problem either.

In the cost of ownership category, the T6045 triumphs, *saving up to \$1,663 over its' closest competitors* in the first year of ownership. Isn't it time you printed on a Tally?

JUST CALL 1-800-843-1347 EXT. 541 for more information, or contact your local reseller.

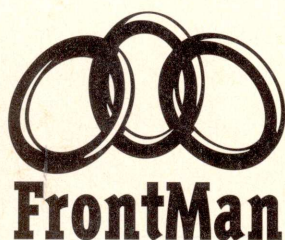
Tally[®]
printers

[Making An Impact On The Way You Print]

a **mannesmann** technology company
CIRCLE 180 ON READER CARD

First Flight On Migration Path

FrontMan gives HP3000 legacy applications new life.



"... customers are looking to go client/server. FrontMan provides a path to migrate over time, without a huge expense."

Looking for a way to ease your enterprise into client/server technology without spending a lot of time and resources up front? We can answer your needs with FrontMan, our client/server development tool that gives Windows clients enterprise-wide database access from a variety of sources. Many sites have reported that FrontMan is proving successful in migrating legacy applications to client/server architecture.

Advacate leads the way

One of these beta sites is ACAT, a division of Advacate Inc. of Indianapolis. Advacate builds custom software and add-ons for HP sites that use ASK software. ACAT (Advanced Computer Analysis Technique) is the division that will be moving this ASK marketplace to a client/server environment. To make the migration possible, ACAT is combining Advacate's own VPlus-based add-ons with the tools of FrontMan.

"FrontMan allows ASK customers to integrate the functionality of ASK into a client/server environment," explains Daniel Levite, product manager for ACAT. "ASK custom-

ers are looking to go client/server. FrontMan provides a path to migrate over time, without a huge expense."

Levite sees FrontMan's ability to convert VPlus applications to a client/server environment as key. FrontMan does the conversion by splitting an application into a front-end section to handle the user interface and a back-end section containing the original VPlus code. A special library is linked to the application and intercepts interface-related VPlus calls, routing them to the front-end for further processing. The front-end automatically maps VPlus screen elements to appropriate graphical user interface elements.

Because FrontMan allows VPlus applications to easily convert to a Windows client interface, ACAT can convert their custom ASK software with relative ease.

First step — a facelift

As their first project, ACAT has been using FrontMan to convert a pilot application on the HP3000 into a client/server application. After a short time with FrontMan,

Levite found the interface easy to create, and got the screens coming up first. Work on the lower-level communication came next.

FrontMan provides access to IMAGE, Oracle, Sybase, Ingres, and many other database formats, and supports the ODBC standard. It also supports third-party indexing software, such as Omnidex, and Superdex. With FrontMan, you can incorporate data from completely different environments into a single, coherent interface. For ACAT's ASK customer base, FrontMan's flexibility means that users can integrate the Oracle data from their HP9000 with the ASK data on their HP3000.

"Advacate's been in the HP/ASK market since ASK first came out, 15 years ago" says Levite. "Turning our marketplace into client/server will be a real boon."

Without a transitional tool such as FrontMan, the outlay of resources for converting legacy applications to a client/server environment are tremendous, Levite observes. FrontMan alleviates this turmoil and cost.

FrontMan makes VPlus easy

Other sites have also reported significant success. Jeff Bales at Medford Oregon School District, for example, says they have already converted one of their major HP3000 applications, "without any

problem." Developer Dave Vorgang at Medford adds that FrontMan was easy to use in developing a client/server application to access the school district's IMAGE database.

"I was surprised at how good the screens looked," says Vorgang, after converting the first View file, "They did need some tweaking, he says, "But they were easy to customize."

FrontMan uses a Microsoft Access compatible database as its native data structure, but can access virtually any database via ODBC. It runs as a Windows application on the PC, where you have access to a variety of tools for building a Windows-based database application. This application can be used as a front-end to access enterprise-wide data.

Command performance

FrontMan includes a command language of 180-plus commands, as well as encapsulated commands that provide a huge savings in development time. The interactive development environment allows you to execute single commands in any order and check the results as you develop. You can create libraries of commonly used scripts and embed replaceable parameters that will automatically change according to the operating environment. FrontMan's script editor also allows you to execute commands as you enter them, including ISQL-compatible commands.

FrontMan also features a Visual Basic code generator that actually writes the source code for the user, shortening development time.

FrontMan allows you to manage your databases. You can create, modify, rename or delete databases, tables, and items. You can use FrontMan to query all of your corporate databases. Using FrontMan, you can add, change, search, and delete data while you are developing and testing the user interface.

Link a wide range of data

With FrontMan, you can create not only front-end screens for editing and entering data, you can also create reports, new databases, and new database tables. You can also:

- Change the structure of existing tables and the format of existing table items.
- Add or remove indexes to tables.
- Create data dictionaries.
- Access multiple databases and tables, attach tables and move whole tables between databases.
- Set user's security levels.

An OCX/OLE Controls Toolbox in FrontMan includes controls for buttons, Image database access and VPlus. These controls link Powerbuilder, Visual Basic or Delphi applications directly to Image databases.

FrontMan gives HP3000 users a conversion path for their legacy database applications, without need for terminal emulation, and with no session using up resources on the HP3000. To use a FrontMan application for accessing HP3000 data, the host must have ThinLan Link, and the user must have a WinSock-compliant TCP/IP stack. That's all. FrontMan's integration to host data gives your users all the advantages of client/server computing: seamless, simple and fast connections.

With FrontMan, you can take your users to a client/server environment now, without changing any VPlus source, without making changes to your database, and without altering your legacy applications.

Note: To find out more about ACAT's services, you can reach them at 317/577-8729.



MiniSoft Inc.
312 Maple Ave.
Snohomish WA 98290
FAX 360/568-2923
Ph. 800/682-0200

MiniSoft Marketing AG
Papiermühlweg
CH-6048 Horw, Switzerland
FAX 41.41.340 38 66
Ph. 41.41.340 23 20

800/682-0200

CIRCLE 472 ON READER CARD

CONNECTIVITY COMPARED

MiniSoft 92 V4.0 **Base price: \$169**

MiniSoft Inc.
(800) 682-0200
<http://www.minisoft.com>

Circle 339 on reader card

Minisoft 92 from MiniSoft Inc. (Snohomish, Wash.) provides full HP 700/92, HP ANSI and Digital VT320/220 CRT terminal emulation for Windows, Windows NT, Windows 95, Macintosh, DOS, OS/2, SCO and Sun platforms. It allows connections to HP, UNIX and Digital hosts across Ethernet, Token Ring or ARCnet LANs.

Minisoft 92 provides a command language similar to DOS; DDE and OLE Automation support; Windows screen handling with support for pull-down menus, menu bars and side bars; and keyboard remapping. Other features include inverse video, variable screen intensities, underlining, blinking characters and secure fields. Minisoft 92 can break to DOS without logging off. It also provides complete HP printer function support, including copy all, copy page, copy line, log top, log bottom and record mode. It has full editing capabilities: clear line, clear display, insert line, insert character, delete line and delete character. And, it supports line drawing and foreign character sets; multipage scrolling memory up to 60 pages, and a screen display capacity of 43 lines and 132 characters per line.

Bundled connectivity options include its own 32-bit WinSock-compliant TCP/IP stack, NS, LAT and Telnet virtual terminal protocols. Minisoft 92 provides proprietary file transfer, as well as support for ftp, PCNFS, LAN Workplace for DOS, Chameleon, NOV*ix, Frontier, Microsoft TCP/IP and Wollongong.

Online help and technical support is included.

Teemtalk-TCP/IP **Base price: \$99**

Pericom Inc.
(609) 588-5300
sales@pericom-usa.com

Circle 344 on reader card

Teemtalk-TCP/IP from Pericom Inc. (Lawrenceville, N.J.) provides HP 2347/2622/2393 and 700/92 emulation, as well as Digital VT emulation, for Windows, DOS and X Windows environments connecting to HP 3000 and HP 9000 systems and Digital, IBM, ANSI, Data General, Prime, Tandem, Tektronix, Viewdata, Westward and Wyse hosts.

Teemtalk-TCP/IP features Windows DDL performance for non-TSR-based multiplexing of sessions, and supports packet driver, NDIS and ODI network drivers for interfacing with popular network cards through industry standard specifications. It is Ethernet-11 frame compatible; a multiple protocol stack configuration operates concurrently with other NDIS stacks including NetWare and LAT. A single Windows .INI file contains formatted network configuration parameters.

The software, available in nine language versions, features configurable Ethernet packet and maximum receive/transmit window sizes, bootp and name servers, local IP address and net mask values. It also includes PING client and network statistics monitor. ftp and terminal emulation is included for other clients.

Rumba for the HP **Base price: \$400**

Wall Data
(206) 814-WALL
<http://www.walldata.com>

Circle 343 on reader card

The Rumba family from Wall Data (Kirkland, Wash.) includes Rumba for the HP, which provides HP 700/94, HP 700/92, HP 700/96, HP 700/98, HP 2394A and HP 2392 terminal emulation for connecting to HP 3000 and HP 9000 machines.

Interface features include: file transfer, a configuration toolbar and menus, a consistent user interface and online help. A mail integration feature allows users to integrate host applications and LAN based E-mail systems such as Microsoft Mail or Lotus cc:Mail. Rumba Tools products (sold separately) support APPC, Windows DDE, PowerBuilder, HLLAPI and Visual Basic to help users write custom front ends to UNIX hosts. Tools for Visual Basic costs \$200.

For TCP/IP communications, Rumba for the HP includes a 32-bit WinSock-compliant TCP/IP stack developed by TGV. TCP/IP capabilities also include a suite of TCP/IP applications and an optional feature called Rumba for the Internet, which costs \$100. The applications include Rumba File Manager, which uses ftp, LPD and LPR print utilities for routing TCP/IP print jobs; a dialer for remote access using the SLIP and PPP protocols; and other applications such as PING, uuencode, TIRPC, NFM and WinSNMP. Extensive font and color support also are included.

Rumba Office for NetWare Systems costs \$400. Rumba Office for Microsoft SNA Server costs \$150. Rumba Gateway System costs \$2,990. Technical support is available.

5PM Term for HP Systems **Base price: \$299**

White Pine Software Inc.
(603) 886-9050

Circle 342 on reader card

The host-connectivity family from White Pine Software Inc. (Nashua, N.H.) includes 5PM Term for HP Systems, which provides HP 700/94, HP 700/92, HP 700/96, HP 700/98, HP 2394A and HP 2392 terminal emulation for connecting to HP 1000, HP 3000 and HP 9000 machines. Connections can be made via TCP/IP, direct serial connection and modem links. File transfers to and from the host can occur using ftp, IND\$File, ZMODEM, YMODEM, XMODEM or Kermit. Provides multiple, simultaneous sessions, printer support for VT terminals, choice of screen fronts, drag-and-drop keyboard mapping, online help, color mapping, movable status bar, WatchMe automatic macro script recorder, and hotkeys, hotspots and keyboard macros.

Compliant with Windows and Macintosh, 5PM Term ships with a TCP/IP stack, including the WinSock 1.1 API, and supports other WinSock 1.1 TCP/IP stacks. 5PM Term products can be enhanced with 5PM Pro — an optional terminal emulation front-end tool, GUI builder and distributed application development environment.



It's not the first name you thought of. It's not even the second. It's Xerox. Because in the years since we invented the laser printer, we've invested more time and effort than anyone in developing printing systems capable of moving from traditional data

WHO INVENTED THE LASER PRINTER?

More peace of mind.

We understand that as you reengineer systems to new client/server architectures, you need to protect investments in legacy applications. That's why



centers to distributed computing environments. In fact, no one else has printers so capable of optimizing your reengineered information systems.

More solutions. More options.

In today's business environment, if you don't maximize your IT investments, you won't be in business for long. The improved productivity you need requires printing systems that can be configured to

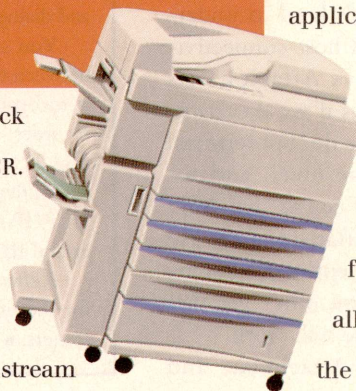
maximize your applications. Printing systems that range from production-level, high-functionality machines to console and desktop printers capable of delivering documents enterprise-wide when, where, and

how you need them, in black and white, color, even MICR.

More compatibility.

More flexibility.

Excellent hardware connectivity and multiple data stream compatibility, as well as advanced paper-handling capabilities, make Xerox midrange laser printers perfect for virtually any environment. And as they come with a range of software solutions and network services, our printers are easy to use and manage across any network.



Xerox Printing Systems are designed to be past, present, and future proof. Best of all, they come with the unique Xerox Total

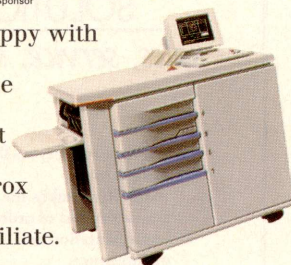
Satisfaction Guarantee, as well as 25 years of laser printer expertise. For



THE DOCUMENT COMPANY
XEROX
Worldwide Sponsor

more information on printers

you can be happy with now and in the future, contact your local Xerox Marketing Affiliate.



Or for an informative white paper on midrange printing systems, call

1-800-ASK-XEROX, ext. 233.

THE SAME PEOPLE WHO REENGINEERED ENTERPRISE PRINTING.

THE DOCUMENT COMPANY
XEROX

CIRCLE 115 ON READER CARD

XEROX® The Document Company® and the stylized X are trademarks of XEROX CORPORATION. Contact Xerox for details on the Total Satisfaction Guarantee. 56 USC 380.

information from multiple hosts using a common Windows interface. Moreover, look for vendors to follow Attachmate and WRQ's lead in host-connectivity support for Windows NT and Windows 95.

Emulation products, such as WRQ's Reflection, offer standard features you should expect from any emulation software. Precise emulation should be a given. HP 700/98 text emulation is a minimum requirement. Not all vendors offer this.

But vendors are moving beyond simple emulation. "It's hard to understand sometimes what host-connectivity vendors do," says Attachmate's Chow. "People ask us if we do terminal emulation. Yes we do, but terminal emulation is but one level, and we build on top of it. Of course, we don't look down on emulation, because that's the core of our entire communications strategy. If you don't get that part right, nothing else will work."

Vendors such as Attachmate and

CONNECTIVITY COMPARED

Reflection 1
Base price: \$399

WRQ
(206) 217-7100
info@wrq.com

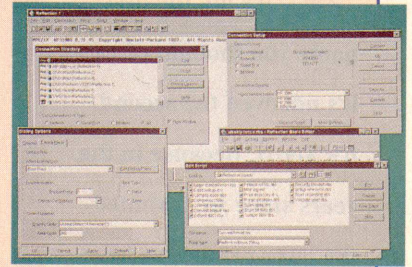
Circle 341 on reader card

WRQ Inc. (Seattle, Wash.) offers Reflection 1 for Windows 95 and Windows NT, which runs applications written for HP 700/98 and HP 700/96 terminals — as well as Digital VT220/102/52 emulation — for connectivity to HP 1000, HP 3000 and HP 9000 machines and UNIX hosts. Reflection 1 provides pull-down menus, a button palette, feature control, command finds and dialog boxes, and the ability to copy-and-paste between host and Windows applications.

You can run host sessions and Windows applications simultaneously and transfer data between them with the copy-and-paste functions and file transfer. DDE or OLE automation is incorporated into Reflection's BASIC-like scripting language, which features a script recorder, and is executed by the host, mapped keystroke, toolbar, DDE or OLE automation. With Reflection's dialog box, you can print text or graphics to your Windows printer.

Reflection supports CTERM, Telnet, WRQ's Reflection Network Series, any TCP/IP stack that supports WinSock, Novell networks, BAPI, Interrupt-14, V.25 server and IBM LAN Asynchronous Connection Server.

Reflection includes online help, and WRQ provides technical support at no charge for the life of the product, as well as one year of maintenance for new site-license customers. ■



WRQ's Reflection 1 software runs host, Windows 95 and Windows NT applications simultaneously and transfers files between them.

THE TOTAL SOLUTION

sales, service, support

On-time service, on-line equipment.

Black River takes the risk and worry out of ordering, implementation and maintenance.

You're assured:

■ Full line of new and previously owned, refurbished 9000, 3000 and 1000.

■ Technically trained maintenance team.

■ Free installation

■ Nationwide service.

Call 216-365-9950 or fax 216-365-3916 for more information.

BLACK RIVER
COMPUTERS

THE TOTAL SOLUTION
sales, service, support

7630 RACE ROAD • NORTH RIDGEVILLE, OHIO 44039
216-365-9950

CIRCLE 171 ON READER CARD

Make the UNIX to MPE Connection

IX/92™

Full featured HP terminal emulation

New! Version 6

Faster File Transfer
NS/VT Network Option
Enhanced Script Language

Available for:

HP-UX

SCO UNIX

SunOS/Solaris

Software Licensing Corp., Suite 280, 930 Tahoe Blvd. Unit #802
Incline Village, NV 89451-9436

Phone: (800) 831-0882 or (702) 832-0881 Fax: (702) 832-0883

http://www.slcorp.com

sales@slcorp.com

All trademarks are the property of their respective holders.

CIRCLE 123 ON READER CARD



IN AUTOMATED TAPE LIBRARIES, YOU CAN'T AFFORD TO PLAY AROUND.

Especially since your company's business critical data requires serious, fail safe storage solutions. NOW, HP certified and recommended DLT™ automated solutions are available from ATL Products™.

These robust libraries combine industry leading DLT tape technology from Quantum Corp. with ATL's field proven automation technology to bring you the high performance solution you've been waiting for.

That's why HP selected ATL Products as its exclusive DLT automated tape library reference partner for their HP9000 Servers. And to assure you success, we're fully compatible with HP's Omniback™ and other

leading data management software packages.

With capacities and performance perfectly matched for the HP9000 system, there's no need to play around with your future needs either.

For years ATL™ has been defining the industry's technology standards, providing unparalleled field proven reliability and support. And by building our libraries to last for many years, ATL will support your future needs when your application become more demanding and enhanced DLT performance products are ready for integration.

So - unless you can afford to play around - contact us now about our complete line of HP endorsed libraries.



ATL's ACL4/52 is Certified For Hewlett-Packard's HP9000 Business Servers.

The ACL4/52 is ideal for heavy duty cycle applications such as OLTP and DSS. It features four DLT drives and 52 20-gigabyte cartridges for an available capacity of more than 1 terabyte. With data compression enabled, capacity is boosted to well over 2 terabytes. Each of the four DLT drives supports a sustained data rate of 1.5 megabytes per second in native mode, at least three times as fast as 8mm drives.

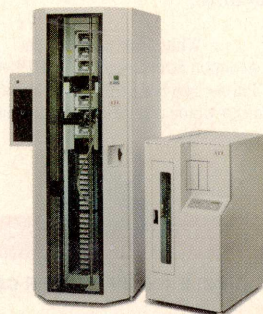
ATL
PRODUCTS
AN ODETICS COMPANY



Quantum

1515 S. Manchester Avenue, Anaheim, California 92802 USA
800-677-6268 714-780 7790 <http://www.atlp.com/>

CIRCLE 241 ON READER CARD



WRQ have adopted a Microsoft Office look-and-feel, with toolbars that let you automate tasks to a push button. Leading emulation products also are defined by their programmability. In other words, the set of features and services that can integrate host data with Windows applications. For example, users want products that offer a scripting language to automate repetitive tasks, enhancing flow control and user interaction.

Vendors are providing other features to differentiate themselves from the competition. WRQ is distinguished for providing features that come at no extra charge to its customers — namely, Internet tools, a scripting language and its own TCP/IP stack. A lot of vendors say they support TCP/IP, but what they support is only a kernel implementation of TCP/IP, such as TGV's TCP/IP stack.

While a good single-purpose emulation product such as Teemtalk from

Pericom Inc. (Lawrenceville, N.J.) is ideally suited for many HP system managers' needs, there's also a growing demand for terminal emulation software that is part of a connectivity suite. Wall Data (Kirkland, Wash.) pioneered this concept in 1993 when it introduced Rumba Office, host software that integrates information from IBM mainframe, AS/400, VAX and UNIX hosts using a common Windows interface. While Wall Data does not yet have significant market share, it is making gains with Rumba Office. According to IDC's Rainge, Rumba Office had the largest market share in 1995 for a multihost suite that extends beyond the IBM arena.

Other emulation vendors also have released connectivity suites. WRQ's suite offering takes a different approach from Wall Data. Its Reflection Select-Suite allows you to build the combination of WRQ products you want. FutureSoft's recently released Dyna-

Comm Connectivity Series "emulates" WRQ's a la cart approach with 32-bit computing options, and also provides support for HP VT network connectors. White Pine Software Inc. (Nashua, N.H.), which recently acquired About Software Inc. (La Gaude, France), now offers a module product set providing connections from Windows, Windows 95, Power Macintosh and Macintosh desktops to HP hosts, VAX, IBM Mainframe and AS/400.

In a world where client-server is the media darling and on the minds of many a system manager, it's easy to overlook host-connectivity software. But terminal emulation remains a real solution for system managers who want to retain their investment in host-based platforms. —*Donna Gasiewski, Contributing Technical Editor. She can be reached at gasiewskdm@box101.cardinal.com.*

Keeping You Connected



5PM TERM

Terminal Emulation for HP Systems & More

Rely on White Pine's 5PM Term for HP to access HP100, HP3000, and HP9000 hosts.

Automate tasks and customize desktops with powerful macros, scripting, and keyboard remapping. Includes ftp client and server, and network and serial connections.

Terminal emulations for AS/400, UNIX/VAX or IBM hosts from your PC or Macintosh also available.

White Pine Software, Inc.
40 Simon Street, Nashua, NH 03060-3043
Phone: 603-886-9050, Fax: 603-886-9051
Internet: info@wpine.com; Europe: euro_info@wpine.com



Sales Hotline 800-241-PINE

<http://www.wpine.com>

ADVERTISING SALES OFFICES

Leslie Ringe, Publisher
(215) 643-8070

EAST COAST (215) 643-8070

Leslie Ringe, Regional Sales Manager
1300 Virginia Drive, Suite 400
Fort Washington, PA 19034
FAX (215) 643-8099

EUROPE 33 42 93 27 63

Fran Grega, European Sales Manager
Villa Bourguet
Chemin de la Fourane
13090 Aix-en-Provence France
FAX 33 42 27 21 17

MIDWEST/SOUTHCENTRAL (215) 643-8063

Gloria Goodwin, Regional Sales Manager
1300 Virginia Drive, Suite 400
Fort Washington, PA 19034
FAX (215) 643-2143

ASIA 65 291 9861

Margaret Liu, Asian Sales Manager
Keith Chin, Account Manager
BLK 105, Boon Keng Road
#04-17, Singapore 1233
FAX 65 293 1445

NORTHWEST/SOUTHWEST (310) 207-8222

Luisa Perticucci, Regional Sales Manager
Suite 1125
12424 Wilshire Blvd.
Los Angeles, CA 90025
FAX (310) 207-4082

Cheryl DeMaiores, Marketing Services Manager
Lisa Merck, Card Deck Manager
Cathy Dodies, List Rental Manager
Lisa Merck, Product Showcase Sales Manager



1300 Virginia Dr.,
Ste. 400
Fort Washington, PA
19034

(215) 643-8000 FAX (215) 643-8099

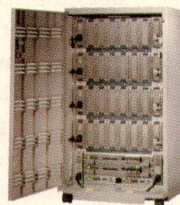
CIRCLE 476 ON READER CARD

THE FASTEST

STORAGE AVAILABLE FOR SOLARIS,
SunOS, AIX, HP-UX, DIGITAL UNIX,
WINDOWS NT™ AND NOVELL.

[ATARI 800 FANS, EAT YOUR HEARTS OUT.]

OK, so maybe there is one machine these multivendor speed demons won't work with. But most any serious computer system can benefit *StorageWorks*™ from their tremendous speed (up to 5500 transactions per second) and utter reliability (dual controllers and hot-swappable components). Add the speed and reliability of MDL Corporation, and you've got a high-performance team that's virtually **digital**™ untouchable. For all the specs, call MDL at (800) 800-3766, (206) 861-6700, e-mail to sales@mdlcorp.com, or <http://www.mdlcorp.com/mdlcorp/welcome.html>.



RAID ARRAY 410 SUBSYSTEM



©1996 Digital Equipment Corporation. Digital, the DIGITAL logo, StorageWorks and the StorageWorks logo are trademarks of Digital Equipment Corp. Digital UNIX V3.2 on Alpha is an X/Open UNIX93 branded product. Windows NT is a trademark of Microsoft Corp. All other products are trademarks or registered trademarks of their respective companies.



Viva La Vim

When in Rome, do as the Romans. When in France, I guess you eat like the French. So as I

write this, I'm in a hotel room in Paris. And I've just ordered *Plat Chaud* (the hot plate; the other choice being the *Plat Froid*, or cold plate) from room service. I got a brown-green soup that smells like the age of fish that my dog would roll in, and a yellow sticky sauce poured all over what otherwise might have been a good apple pie. I hate French food.

As it turns out, it's not the restaurants I don't like, I just hate French food. Did I mention that already? Unappealing French food aside, what does this have to do with UNIX? For that matter, what does it have to do with vi (last month's topic), or vim, which is this month's topic. Well, you see, many people hate vi. But it's not really the editor itself that they hate, it just lacks some appealing features. I guess it's a matter of taste.

Last time, while reviewing the lesser known features of vi I promised a column on vim. So, what does vim stand for anyhow? Now, it stands for VI iMproved, but in earlier (less powerful) versions, it was VI iMitated. There have been many vi++ programs that have come along, the most

notable being the steVie program. vim is an improved vi program based on that project. However, although vim is non-standard, it's readily available in the public domain.

PLUGGING THE HOLES

vim was written by Bram Moolenaar from the Netherlands. Of course there was plenty of input from others, as is the way of public domain software. "Plugging the holes" in vi (only one undo, horizontal scrolling instead of line wrap) and modernizing its features (by adding macros, visual text ranges and rectangular text editing) were the goals in developing vim. Some people say it was to give vi the features of emacs.

vi's undo feature is abysmal. One undo, and even then, it only undoes edits to the current line. vim, on the other hand, allows you to set the number of undos — the default is 100. Use **:set undolines=number** to change that. Even better, there is an un-undo. If you hit **u** four times, and only meant to undo the last 3 edits, a **[CTRL]R** will redo the last undo (technically speaking, you use **[CTRL]R** to step forward through the undo stack).

If **keyboardeedit!** is true, vi allows cursor movement while in insert mode, but vim *always* allows cursor movement while in insert mode. And there are some sequences for moving by more than just one character, such as **[SHIFT] cursor-key** to move by lines and words (**[SHIFT]up-cursor**

moves up one screen).

When you turn off wrap (**:set nowrap**), long lines do not wrap around the window; instead whatever will fit is displayed. If you move the cursor to the right, when you hit the right margin the text will horizontally scroll to the end of the line.

It's rather annoying to **[ESC]** to command mode just to issue one command, then return to the insert (or append) mode. So vim allows a one command escape using the **[CTRL]O** command. For example, as I'm writing this column, if I want to know what line I am on, I enter: **[CTRL]o [CTRL]g** (with vim) then I can just keep typing, and I'm back in insert mode, and the input point is in the same place.

The **wrapmargin** option of vi is somewhat useful, it forces line breaks at the right margin of the window, the problem is, how big is the window. But vim allows setting of a **textwidth**

option to force breaks at a number of columns (**:set textwidth=70**). There are also commands for center, left and right justification for lines of text.

Another sore point: when issuing an ex command from vi, only the backspace key works for editing. In vim, you can move with the cursor keys, insert, delete and even use the page up/down keys to recall previous (then next) commands. There are many more "fixes" to vi, such as making tab insert spaces instead of tabs (**:set expandtabs**), and being able to backspace over line breaks (**:set backspace=number**). But, due to the limited space of this column, let's look at some of the "new" features.

VISUALLY, A JOKE

There are WYSIWYG editors, control sequence editors and dual mode editors, vi is a dual mode editor. Calling vi a visual editor has always been considered a joke. You can't see vi commands as

they are typed, you can't see the line breaks and marks defining ranges of text are invisible.

But, vim has a visual range command: move the cursor to a starting point using any normal vi or vim movement commands, then press the **v** key (the visual range mark command), move the cursor again and the range of text you have marked is highlighted. Most commands will act on the range, as if it was developed with a movement command. The **v** command marks visual ranges of lines. vim also allows commands to act on rectangular blocks of text. Issue the **[CTRL]v** command, and as you move, a rectangle of text is marked. Normal commands issued (**d** for delete, **y** for copy) will act on the rectangle.

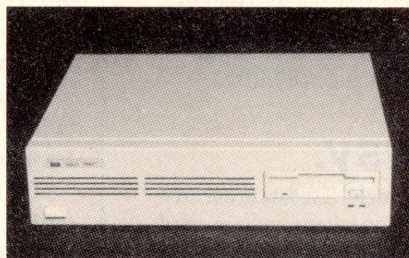
What if there is a pathname reference to another file in the current file you are editing? If you want to read that file, put the cursor on the file name or pathname, and issue **gf**, which means "get file," and that file will be

Looking For Reliable, High Performance **SCSI-II** External Storage Sub-Systems?



Introducing Our **WWW Special*** 2GB Stackable Disk Drive Sub-System. It comes With a Free 5 Year Warranty!

Why Buy Used **HP-IB** Peripherals When You Can Have Real Peace of Mind With New?



Re-Introducing Our **HP9122C** and **HP9153C** Replacement Floppy and Hard Disk Drives With a Free 2 Year Warranty!

ISA manufactures a full line of **SCSI** and **HP-IB** external storage sub-systems for your HP, IBM, SUN, and high-end PC. Our new line of **UNIX Power Management Solutions** can gracefully shutdown local or remote networked systems. Please visit us on the Web, email, or call for more information.

*<http://www.texasisa.com>
800-361-2258, 713-493-9925

email: info@texasisa.com
Texas ISA, Inc.

Texas ISA
HP-IB & SCSI Storage, and
UNIX Power Management Solutions

MYTH:

Fast, Powerful, Flexible, & Easy data warehousing does not exist for the HP3000.

FACT:

HP3000 online data warehousing and selective offline archiving is here!

DB/Access reorders, extracts, transfers, updates, deletes and restores selected data with its *express field mapping* feature.



Fast.

The user interface eliminates the need for scripting or programming.



Powerful.

Automatically builds and/or links multiple databases, datasets and files in one pass.



Flexible.

Moves data between IMAGE, KSAM, flat files and tape. Cross-platform downloading to RDBMS. Integrates with OMNIDEX and SUPERDEX.



Easy.

Creates meaningful test data in one step, without limits on criteria or the quantity of fields selected. DB/Access saves many programming hours.

For **FREE** demo contact:

Datastructure

246 First Street, Suite 205
San Francisco, CA 94105
(415) 495-7484 Fax (415) 495-7485



All trademarks are the property of their respective owners.

CIRCLE 231 ON READER CARD

loaded into a buffer. You also can move around by percentage of file: 20% means jump to the 20 percent point in this file.

You can record macros, much like in emacs, with the **q<c>** command, where **<c>** is a buffer name from a-z. To re-execute the sequence of commands stored in the buffer, use **<c>** where **<c>** is the same buffer letter. There is even a command and filename completion function, to complete ex commands, and filenames for you, the tab key invokes the completion. Virtually all the keys are now valid vi commands, and many control sequences have been mapped also, as there are so many more commands in vim than vi.

Let's take a look at multiple windows and buffers. Yup, just like in emacs. You can start a single vim program running in a single terminal or terminal emulator window, and split the screen into multiple "virtual" windows, each showing a different file or different part of the same file. One could even be a shell access window. Every window shows a buffer, a buffer is typically a file, but you can have buffers loaded that are not displayed in a window (hidden buffer).

To open a new window, use the **:split [file]** command (or use **[CTRL]w[CTRL]s**). If you supply a filename, a new buffer is created, and the file specified is loaded. If no filename is supplied, another window viewing the same file is created. Once you have multiple windows open, you can move between windows with the **[CTRL]w** commands: **[CTRL]w [down-arrow]** or **[up-arrow]** to move up or down a window, and **[CTRL]w [CTRL]w** to cycle through windows. Windows can be sized with **[CTRL]w** followed by: - for smaller, + for bigger and = to make all windows the same size.

You can make a hidden buffer with

the **:close** command issued in a window. There is also the **:buffers** command which gets a list of all buffers, then you can load a hidden buffer into the current window with **:Nbuf** thus working with more buffers (files) than windows. Because you can act on many buffers, there are now "global"

commands called marks that remember which file they are placed in (upper case marks instead of lower case marks), and commands like: **:qall**, **:wall** and **:xall** to quit, write and exit from all buffers. It's similar to placing a bookmark — hey!

what a great name for them— too bad the documentation calls them marks.

This is only a brief overview of vim. So, where do you go for more information? Well, the good news is that vim is very well documented. There are several files breaking vim down into manageable pieces, and a rather large man page. The documentation is usually loaded into `/usr/local/lib/vim`.

So where do you get vim? Because it's in the public domain, you can get vim from the Internet. Additional information can be found on the Web. Here are some suggested ftp and Web sites to try:

ftp.tu-graz.ac.at
ftp.edvz.uni-linz.at
ftp.bhp.com.au/aurana.ccs.deakin.edu.au
www.calypso.com:80/vim/
vimother.html
www.calypso.com:80/vim/
vimpages.html

—Soon, Fred will be returning from his adventures as an American programmer in Paris. Let him know what topics you find tasty by sending a message to him at frederm@aol.com.

Would you like to continue to see articles on this topic?

Circle on reader card

yes 306 no 305



Web Slinging Via The Microsoft Gates-way

By now, I'm sure you've heard Bill Gates telling you and everyone who would listen (and that's

practically the entire world) about Microsoft's Internet strategy, and his plans to make the Internet an extended member of Microsoft's application family. Not surprisingly, a number of industry insiders were skeptical. After all, this past fall, Wall Street investors flocked to Netscape Communications' IPO because it was the closest thing to owning stock in "the Internet." And while Netscape's stock was rising like a Saturn rocket, Microsoft's stock dropped like a burned-out meteor. On paper, Netscape now appears to have an overwhelming, if not insurmountable lead. And their momentum seems unstoppable. Why? Because popular wisdom holds that Microsoft lacks an Internet strategy.

But Microsoft didn't get where it is today by missing significant trends. And I have to believe that all the Internet excitement hasn't been a big surprise to Microsoft's marketing department. This spring, Microsoft will ship an http (hypertext protocol) server and an HTML (hypertext markup language) browser that will challenge Netscape for dominance of the server market (at least on Intel CPU-based

servers). And, with the kind of success that Windows NT is having in large corporations running on Intel-based servers, Microsoft is well-positioned for the high ground.

LOVE ME LIKE A ROCK

The product, Microsoft's Internet Server (code-named Gibraltar), features an http server, an ftp server and a gopher server, all managed from the same kind of "back office" application manager as the NT-based SQL Server. All three products install as NT services which, like daemons in HP-UX environments, start up every time your system reboots. This means that your server does not need to be logged in to serve Web, ftp and gopher clients. In other words, you don't need to be logged on for your NT Server system to be actively serving clients — even if your site has suffered a temporary power loss.

Microsoft's Web server features full security, full access to server-side CGI programming and full database connectivity that lets you use your ODBC, SQL Server or Access database for logging as well as for storage of Web documents. This database connectivity lets you use an external database for logging, but it also allows you to use the database as a repository for documents you want to serve. The Web supports standard scripting and CGI access, but it also supports Microsoft's own Internet Server Application Pro-



All the solutions you ever wanted in one database utility!

**CAPACITY
MANAGEMENT**

**STRUCTURAL
CHANGES**

**FAULT ANALYSIS
WITH REPAIR**

**PERFORMANCE
ANALYSIS**

TREND ANALYSIS

**TEST DATABASE
GENERATION**

**DISK SPACE
MANAGEMENT**

DBGGENERAL diagnoses and enhances the structure of your IMAGE database(s), and supports Jumbo datasets, IMAGE/SQL, DDX and TPI. It's also fully integrated with Netbase.



**Call today for a FREE
30-day evaluation!
1-800-294-1190**



BRADMARK
Technologies, Inc.

CIRCLE 108 ON READER CARD

gramming Interface (ISAPI) for more efficient programmatic customization of your Web site.

Security can be based on IP addresses, the NT Access Control List (ACL), NT usernames and passwords, or by using the Secure Sockets Layer (SSL) and RSA encryption. The server also provides support for Private Communication Technology (PCT), an enhancement and secure upgrade to the SSL protocol. Microsoft also intends to add Secure Transaction Technology (STT), developed jointly by Microsoft and Visa International, to support electronic payment technology. This integrated database connectivity positions Microsoft's Web offering as part of the full Microsoft BackOffice suite.

No Internet strategy? I don't think so.

The Microsoft Internet product suite also features an enhanced Web browser called the Microsoft Internet Explorer. It provides many of the browser enhancements such as table support and enhanced HTML, already included in Netscape's Navigator browser. And while Bill Gates may prefer Visual Basic (VB) as the scripting language, he has already stated that JavaScript will be in Microsoft's future. This makes it difficult for ISVs and IS development shops to know which way to go in building and deploying Web tools. Although JavaScript seems to be most promising as an industry solution, Microsoft's staying power can't be discounted, especially if they decide to emphasize VB.

GO, GO GOPHERS

The Microsoft Internet Server includes a full gopher server. Gopher is another of the popular Internet services that gives you the ability to create a full-blown information system. Originally developed at the University of Minnesota (the gophers), you can use gopher servers to locate and fetch (or go-for) information worldwide. With this, you can create your own gopher pages to publish ftp, Telnet, ASCII and other types of data sources worldwide. This lets you organize your information either for external Internet publishing or for internal "intranet" information stores. Microsoft

is one of the few providers of commercial gopher servers, and this stands to be a significant part of the suite for people who want to provide information in more than just Web pages.

ftp services has been part of Windows NT for some time. However, the new ftp server provides professional menu-driven system administration, logging and access control from the same kind of menu system as the Web service. It allows you to limit access to individual directories, easily create the messages and announcements within directories, and general control a secure ftp site. Clearly, Microsoft's Internet Server is meant to be a serious challenge to other http server software, but the fully integrated suite of applications shows that Microsoft is indeed planning to own the territory (so what else is new?). Expect to see Internet connectivity built into BackOffice products like SQL Server to end-user applications like Microsoft Word for Windows.

Nevertheless, the stock market is betting on Netscape, at least for now. Netscape was one of the earliest commercial http server providers to ship a product with full security. And they were certainly one of the first to provide cross-platform administration tools. A number of vendors, including O'Reilly and Associates' WebSite for Windows, Windows 95 and Windows NT, have easy-to-configure and easy-to-manage servers. But, few of them are as ubiquitous and platform-neutral as Netscape's product. And although Microsoft has announced its intentions, firm delivery dates are yet to be forthcoming. Still, when the smoke clears, I wouldn't be surprised to see Microsoft as the eventual winner in the Web-related products market. After all, profitability is what keeps companies going and I think Microsoft can and will be a profitable Web company.

—Miles, part of the mobile workforce, actually gets to live and work in Santa Clara, California — sometimes. But you can always reach him by E-mail at mbk@ideaeng.com, or visit his WWW home page at <http://www.ideaeng.com>.

Would you like to continue to see articles on this topic?

Circle on reader card

yes 304 no 303

READER INFORMATION

CONCORDE TECHNOLOGIES CIRCLE 232

Concorde Technologies, Inc., "The Hewlett-Packard Experts" is an HP Channel Partner and Value Added Reseller of HP and third-party products for the HP 9000. Concorde's line of products includes HP 9000 systems, application software, CD-ROM solutions, RAM memory, mass storage peripherals and accessories. For the best prices, availability, warranty and support, **Concorde Technologies**. Call (800) 359-0282.

IEM CO. CIRCLE 122

IEM offers affordable solutions for the HP environment, including 4mm and 8mm tape drives, autofeeders and carousels, QIC tape drives, optical drives, fixed winchester drives, floppy disk drives and combination drives. IEM's new Building Block product line is a modular storage solution into which you can slide a number of different disk, tape and optical units. IEM offers an automated back-up and archival software solution. Most IEM products are available with an HP-IB or SCSI interface for HP 1000, 3000 and 9000 computers.

Call (970) 221-3005 or (800) 321-4671, or send E-mail to info@iem.com.

KINGSTON TECHNOLOGY CORP. CIRCLE 281

Kingston Technology designs and manufactures memory upgrades for PCs, laptops, workstations and laser printers. The Kingston product line also features mass storage subsystems and processor upgrades. Call (800) 835-2545, FAX (714) 435-2699.

MINISOFT INC. CIRCLE 472

Minisoft 92 for DOS and Windows providing HP terminal emulation and LAN connectivity for just \$159. Call (800) 682-0200.

NEWPORT DIGITAL CORP. CIRCLE 246

Accelerator cards for HP 9000 Series 200 plus HP 310 and HP 320. Ten-fold performance improvement. Call (714) 730-3644.

QUEST SOFTWARE CIRCLE 268

The only complete HP 3000 solution for:

- 1) High speed network file and database access.
- 2) IMAGE, KSAM and MPE file shadowing.
- 3) Low overhead and network spooling.

Call (714) 720-1434.

TEXAS ISA INC. CIRCLE 127

HP-IB and SCSI Tape and Disk Storage • Data Buffers • Power Management Solutions for UNIX and non-UNIX Platforms. Manufacturers of storage solutions for HP environment for 15 years. With our unique new line of Intelligent Automatic Startup and Shutdown devices, companies can now control the AC power ON/OFF schedules of local and remote UNIX systems. The ISA 7030, for instance, can warn of abnormal environmental conditions (temperature, vibration, humidity and smoke), and perform graceful shutdowns and startups. These new devices can significantly enhance system and data security, save time, energy and equipment costs. They also tremendously increase the convenience of managing local and remote systems.

For more information visit us on the World Wide Web:
<http://www.texasisa.com>,
E-mail: info@texasisa.com, or call (713) 493-5746/ (800) 361-2258.

UNISON SOFTWARE INC. CIRCLE 499

Unison-Tymlabs is a supplier of networked systems management solutions for both UNIX and MPE. Product areas include workload management, storage management, print automation and desktop integration. Call (408) 245-3000.

WRQ (WALKER RICHER & QUINN) CIRCLE 263

Makers of Reflection Series Software. HP terminal emulation for PCs and Macintoshes. Call (800) 872-2829.

ADVERTISER INDEX

Reader Service Number	Page
104	Adager32
241	ATL Products41
171	Black River Computers40
108	Bradmark Technologies, Inc.48
294	Camintonn Z-RAM Corp.8
496	Computer Marketing International ...16
232	Concorde TechnologiesC2
213	CSU Industries30
466	Data Assurance Corp.4
231	Datastructure46
459	Finnish HP National Users Group50
190	FutureSoft Engineering Inc.C3
166	G.E. Capital16
	Hewlett Packard - CA10-11
149	IBM Corp12-13
122	IEM, Inc.2
218	Insignia Solutions15
107	ITAC Systems, Inc.20
281	Kingston Technology Corp.1
180	Mannesmann Tally Corp.35
155	M.B. Foster Associates52
168	MDL Corp.31
293	MDL Corp.43
472	MiniSoft, Inc.36-37
246	Newport Digital Corp.6
462	Quest Software19
175	Quest Software21
481	Quest Software23
483	Quest Software25
269	Quest Software27
268	Quest Software29
261	Simple Technology17
123	Software Licensing Corporation40
165	Sungard Recovery Services24
127	Texas ISA, Inc.45
137	Technical & Scientific Application (TSA)53
138	Unipress Software30
499	Unison Software26
	Walker Richer & Quinn, Inc.C4
201	Wesson, Taylor & Wells51
476	White Pine Software42
253	Workstation Solutions52
115	Xerox Corp.39
183	Xerox Corp.5

*The publisher does not assume any liability for errors and omissions.

UNIX is a registered trademark of AT&T in the U.S.A. and in other countries.
MS-DOS is a trademark of Microsoft Corp.
Macintosh is a trademark of Apple Computer Inc.
X Window System is a trademark of MIT.
Windows is a registered trademark of Microsoft Corp.
Windows NT is a registered trademark of Microsoft Corp.
NetWare is a registered trademark of Novell Inc.

HP Professional

1300 Virginia Dr., Ste. 400
Fort Washington, PA 19034
(215) 643-8000 FAX (215) 643-8099

Midnight Lights '96

International HP Users' Conference

Helsinki-Stockholm-Tallinn

10-12 June 1996

The event of the year

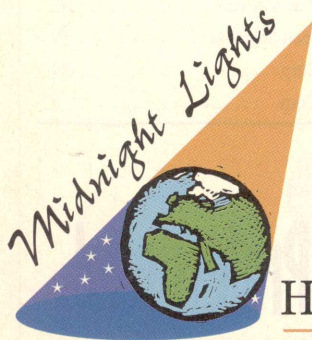
Midnight Lights '96 will be the largest European event for HP users in 1996. The conference will take place on the Baltic Sea aboard the Silja Line's M/S Symphony, one of the world's most luxurious cruisers and a floating conference facility.

The Symphony provides a first class setting for official business. It also offers many ideal places to meet your colleagues as well as important speakers, business partners, and professionals outside of the scheduled conference agenda. Ideas and visions can be exchanged during the journey.

Share Visions - Keep on Moving!

We have focused the program of this conference to help IT professionals collect and share information with other users from around the world. With its Main Conference, EXPO, HP Technology Center and Pre-Conference Training Courses, Midnight Lights '96 will present an open view of the future.

Secure your place in this important conference.
Don't delay, register right away!



HP Users' Conference '96

Midnight Lights HP Users' Conference '96 Secretariat
c/o CONGREX

P.O.Box 40, FIN-00621 HELSINKI, FINLAND

Telephone +358 0 752 3611, telefax +358 0 752 0899, Internet [HTTP://www.finug.fi](http://www.finug.fi)

CIRCLE 459 ON READER CARD

new Products

STORAGE

Andataco

Andataco announced the Web Storage Manager which allows system administrators to monitor their company's network storage from anywhere there is Internet access. Using a Netscape 2.0 browser, administrators can set their URL to a host that has an Andataco Enterprise Storage Packaging (ESP) storage subsystem attached to it. An on-board computer in the ESP monitors all activity of the devices (tape, disk, RAID, CD-ROM) in the storage subsystem and reports this information back

to the Web Storage Manager.

Circle 399 on reader card

ATL Products

ATL Products Inc. introduced the ACL2/28 automated DLT library.

The ACL2/28 features two DLT4000 drives and 28 cartridges of 20 GB each, for a total capacity of 560 GB. With 2 to 1 data compression, the capacity exceeds 1 TB. Each of the two DLT drives supports a sustained data transfer rate of 1.5 MBps in native mode. With data compression enabled, the data rate doubles to 3 MBps.

Price for the ACL2/28 is \$33,000.

Contact ATL Products, 240 E. Palais Rd., Anaheim, CA 92805; (714) 774-6900.

Circle 398 on reader card

Cheyenne Software

Cheyenne Software Inc. announced Cheyenne Hierarchical Storage Manager (HSM) for UNIX. Cheyenne HSM for UNIX transparently migrates files between magnetic disk and optical disk libraries. It also provides automatic file migration, library management and high-speed backup.

Cheyenne HSM prices begin at \$9,500 for a 16-slot optical library support. Cheyenne HSM for UNIX is available for 20, 32, 56, 64, 99, 144, 160, 288, 432 and 576 slot libraries with prices ranging from \$11,600 for 20 slot support to \$91,500 for 576 slot support.

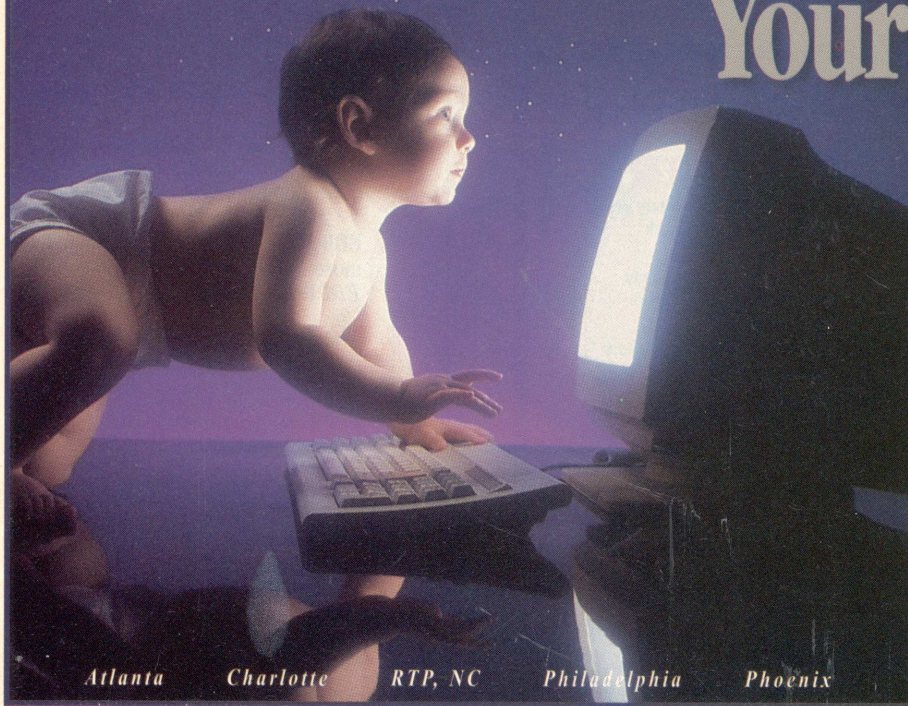
Contact Cheyenne Software Inc., 3 Expwy. Plaza, Roslyn Heights, NY 11577; (516) 484-5110; <http://www.cheyenne.com>.

Circle 397 on reader card

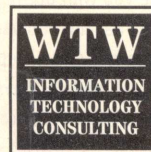
Concorde Technologies

Concorde Technologies Inc. announced that it has formed a partnership with HP as

Information Technology To Grow Your Business.



If growing your company through technology seems like a difficult task, relax. We've got your formula for success. WTW is an information technology consulting firm and systems integrator with a proven track record of helping the world's forward-looking companies remain leading edge in the marketplace. As your technology partner, we'll deliver customized solutions that will help your growing business achieve its objectives.



WESSON, TAYLOR, WELLS
& ASSOCIATES, INC.

800.833.2894

Atlanta Charlotte RTP, NC Philadelphia Phoenix

CIRCLE 201 ON READER CARD

new products

a supplier of DLT Libraries for the HP 9000 business servers.

Under the agreement, HP will recommend and support Concorde's DLT-based Model 452 as the preferred automated tape solution for customers buying its business server products. All library sales, service, installation and support will be handled through Concorde and contracted service organizations.

The Model 452 has been certified on the HP 9000 business servers running HP

OpenView OmniBack II under HP-UX 9.04 or HP-UX 10.0.

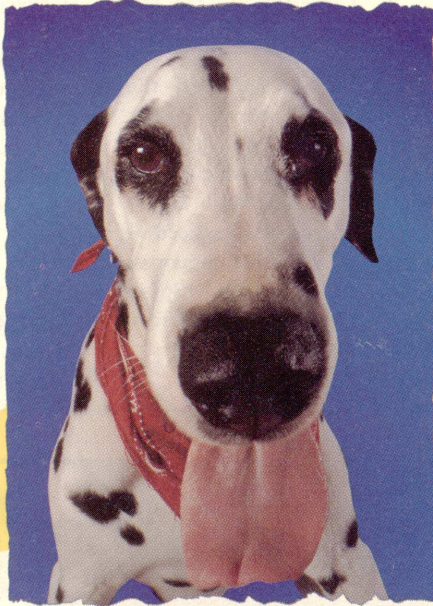
Contact Concorde Technologies Inc., 9770 Carroll Center Rd., Ste. F, San Diego, CA 92126; (619) 536-5500; info@concorde-tech.com.

Circle 395 on reader card

Conner Tape Products

Conner Tape Products Group announced the Tape•Stor 8000, a QIC-3095-compatible Travan minicartridge tape system.

Reliable,
loyal,
and he'll
always
be there
for you
long after
you take
him home



Much like Workstation Solutions

QUICK RESTORE V2

F
E
A
T
U
R
E
S

- Control backup & recovery on a heterogeneous network without using NFS
- On-line indexing, automatic volume location & direct-to-block positioning
- Full support for popular robots and bar code readers
- Easy-to-use and highly reliable or your money back!



workstation solutions, inc.

workstation solutions, inc. • one overlook drive • amherst nh 03031 • 603.880.0080 fax 603.880.0696
e-mail info@worksta.com • http://www.worksta.com

All company and product names are trademarks or registered trademarks of their respective owners.

CIRCLE 253 ON READER CARD



The Power of Efficiency

EDI WINDOWS:TM Enabling technology for business in the '90s

Successful businesses across North America know that Electronic Data Interchange (EDI) is bringing true automated efficiency to a host of everyday tasks formerly done by hand. *EDI WINDOWS* enables the link from your HP3000, HP9000 and other open system platforms, to those all-important customers and suppliers, for purchase orders, quotations, invoices and much more.

EDI WINDOWS supports X12, EDIFACT, TDCC Standards and many more. In the electronic marketplace, *EDI WINDOWS* can work for you.

**For powerful solutions,
call 1-800-ANSWERS**

M.B. Foster Associates Limited
50 Water Street
P.O. Box 580
Chesterville, Ontario
Canada K0C 1H0

Tel (613) 448-2333
Fax (613) 448-2588



Your Integration Software Supplier[®]

EDI WINDOWS is a trademark of trinary systems inc.

CIRCLE 155 ON READER CARD

Available with SCSI-2 or IDE interface options, it is available in internal and external models. The Tape•Stor 8000 operates with 3M's Travan TR-4 media and Sony's QIC-Wide media. The Tape•Stor 8000 minicartridge tape drive features backward read/write compatibility with QIC-3080 format, and is backward read-compatible with a wide range of tape media.

An internal configuration costs \$449, and an external configuration costs \$600. Contact Conner Tape Products Group, 1650 Sunflower Ave., Costa Mesa, CA 92626; (714) 641-1230; <http://www.conner.com>.

Circle 394 on reader card

Kingston Technology

Kingston Technology announced price decreases on their workstation memory line for all HP, Sun, Silicon Graphics, IBM RS/6000 and DEC workstations. Kingston's 64 MB module for HP/ Apollo 750 workstations retails for \$3,395. Note that the HP equivalent module retails for \$4,160.

All Kingston memory is backed by a lifetime warranty with a 24-hour product replacement policy.

Contact Kingston Technology Corp., 17600 Newhope St., Fountain Valley, CA 92708; (714) 435-2600; <http://www.kingston.com>.

Circle 390 on reader card

MDL Corp.

MDL Corp. announced Peak Triad Server. It provides all the benefits of a RAID system (Level 0, 1, 3, or 5) and more, with a failover to hot standby server available. It is compatible with systems running TCP/IP-NFS such as UNIX platforms from HP, Digital, Sun, SGI and Intel.

MDL's file server is up to seven times faster than common NFS file storage systems, supporting high-end data systems used for demanding applications such as online transactions. Features include less than 90 second system restart after a power failure, use of off-the-shelf Intel architecture platforms and a range of storage capacity from 3 GB to 5 TB.

Contact MDL Corp., 14940 N.E. 95th St., Redmond, WA 98052; (206) 861-6700; <http://mdlcorp.com/mdlcorp>.

Circle 374 on reader card

Platinum Technology

Platinum Technology Inc. released Version 2.1 of NetArchive-HSM and NetArchive-Backup.

NetArchive-HSM is a network-based system designed for heterogeneous environ-

ments. Anytime a migrated file is needed, NetArchive automatically and transparently restores the migrated file from the storage vault. A site-based server license starts at \$4,000, and increases as the amount of storage managed in the network increases. A site-based client license costs \$2,000 per operating system.

Both support HP-UX, SunOS and Solaris.

Contact Platinum Technology Inc., 1815 S.

Meyers Rd., Oakbrook Terrace, IL 60181; (708) 620-5000; <http://www.platinum.com>.

Circle 384 on reader card

Visit our Web Site

<http://www.cardinal.com/hppro>

HP RENTALS

HP WORKSTATION SALES & RENTALS



WORKSTATIONS

807	E55	NEW!	755	750	CRX	433 S	CRX	382	360	332
827	F20	J200	735	730	CRX-24	425 T	VRX	362	350	330
847	G30	K200	725	720	CRX-24Z	425 S	GRX	380	345	320
E25	H40	K400	715	710	CRX-48Z	425 E	PVRX	375	340	310
E35	I70	T500	712	705	GRX	400 S/T	EVX	370		

AND MORE . . .

Printers Plotters	X Terminals APOLLO ON Series	PC's Memory	Discs Test Equipment	800 Series Data Acquisition
----------------------	---------------------------------	----------------	-------------------------	--------------------------------

TSA is THE place for daily, weekly, monthly or long term rentals of Hewlett-Packard equipment. Ask about our 6-12 month purchase plans. Equipment available for same day shipment.

1-800-422-4872

713/935-1500 • Fax 713/935-1555 • Email: Info@tsa.com



Authorized
Rental
Company





THE RIGHT EQUIPMENT. RIGHT NOW.



2040 West Sam Houston Parkway N. • Houston, Texas 77043

HP RENTALS

CIRCLE 137 ON READER CARD

PRODUCT **showcase**

HEWLETT

9000 / 3000

- BUY•
- SELL•
- LEASE•
- TRAINING•
- (800)553-0592•

PH: (612) 947-0250
FAX: (612) 947-0267

WORLD DATA PRODUCTS

PACKARD

CIRCLE 486 ON READER CARD

<http://home.navisoft.com/csi6000>



Reflection®
WRQ
AUTHORIZED VAR

- Expert Pre-Sale Consultation
- New HP Business Systems
- Integration of PC Networks
- Systems Integration
- Rentals And Outsourcing
- Disaster Recovery Services

Computer Solutions, Inc.
201-672-6000

CIRCLE 209 ON READER CARD

To: HP Network Managers

Fr: BayState Data Connections, Inc.

Re: Network Solutions

Allow users shared access to Printers and CD-ROM's over multi-vendor, multi-platform environments with our RISC based hardware products. Let us put our network expertise and experience to work for you!

- Resident HP script for easy installation.
- Multiple protocols supported.
- High throughput enabled by RISC processor.
- Flash memory for easy upgrades.
- Security options.
- Ethernet and Token-Ring versions available.

(800) 676-BSDC • Fax: (617) 494-1889

CIRCLE 271 ON READER CARD

Allon Computer, Inc.

*Quality, Integrity, Reliability
Since 1989*

*Buying and Selling HP 1000/
3000/9000 Terminals,
Plotters, Disc Drives, PCs,
Workstation Specialists*

1-800-808-0851

**Fax: 813-724-6567
Direct Dial: 813-724-6566**

CIRCLE 251 ON READER CARD

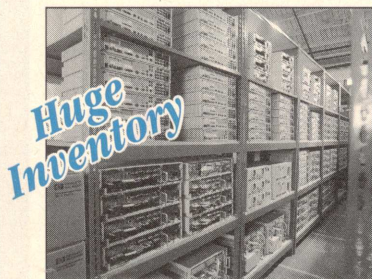
HEWLETT-PACKARD
BUY SELL
RENT REPAIR
9000 1000 3000 TEST
MEMORY - PLOTTERS - PRINTERS
DISC DRIVES - WORKSTATIONS - DATA ACQUISITION
TSA
THE RIGHT EQUIPMENT. RIGHT NOW.
2040 West Sam Houston Parkway N. • Houston, Texas 77043
1-800-422-4872
713/935-1500 FAX 713/935-1555

CIRCLE 228 ON READER CARD

Remanufactured HP 9000 Servers, Workstations
Workstations
INTERNATIONAL
Serious HP Solutions
HP 9000
QUALITY REMANUFACTURED SYSTEMS
SCIENTIFIC WORKSTATIONS
BUSINESS SERVERS
FULL 90 DAY WARRANTY
QUICK TURNAROUND
Large HP Inventory **IN STOCK**
1-800/842-4781
Call for ALL your HP needs!
601 Lakeshore Parkway, Suite 1160, Minnetonka, MN, USA, 55305
612 / 449 - 9000 PH 612 / 449 - 3198 FAX
e-mail: info@workstations.com
Fast International Turnaround, Guaranteed Quality
X-Stations, Terminals, Memory Upgrades, Mass Storage
Printers / Plotters, Network Hardware

CIRCLE 458 ON READER CARD

MONTEREY BAY COMMUNICATIONS
The HP 1000/9000 Specialists



MBC
MONTEREY BAY
COMMUNICATIONS

TEL: 408/429-6144
FAX: 408/429-1918
1010 Fair Avenue
Santa Cruz, CA 95060

CIRCLE 229 ON READER CARD

HEWLETT-PACKARD 9000
IT'S OUR SPECIALTY.

- | | |
|----------------|----------------|
| PRINTERS | PLOTTERS |
| LaserJets | DraftPros |
| DeskJets | DraftMasters |
| Rugged Writers | Electrostatics |
| | DesignJet |

WORKSTATIONS
Series 200, 300, 400, 700
We offer large discounts, outstanding service and immediate delivery. Call us before you buy a printer or plotter!

TED DASHER & ASSOCIATES

4117 2nd Avenue South
Birmingham, AL 35222
(205) 591-4747 or (800) 638-4833
E-mail: sales@dasher.com FAX: (205) 591-1108

CIRCLE 233 ON READER CARD

HEWLETT-PACKARD

1000 • 3000 • 9000

BUY • SELL • RENT • LEASE

MAINTENANCE

PROCESSORS • PERIPHERALS • SYSTEMS

EURODATA INC.

(613) 745-0921

Fax: (613) 745-1172

2574 Sheffield Road, Ottawa, Canada K1B 3V7

CIRCLE 283 ON READER CARD

PRODUCT **showcase**

EDI/EC

Electronic Data Interchange Electronic Commerce

St. Paul Software specializes in high performance EDI software that links applications with trading partners wanting to exchange business documents through EDI. It is designed for integration into your EDI environment and provides the most flexible application integration tool on the market.

Call 1-800-998-4EDI (4334).



ST. PAUL SOFTWARE

1450 ENERGY PARK DR, ST. PAUL, MN 55108
TEL 612/603-4400 FAX 612/603-4403

WWW <http://spedi.com> Email info@spedi.com

CIRCLE 465 ON READER CARD

QUALITY HP EQUIPMENT WITHOUT THE HP PRICE

DON'T UPGRADE YOUR HP SYSTEM UNTIL YOU GET A SECOND OPINION FROM THE SECOND SOURCE FOR HEWLETT-PACKARD

1000-3000-9000 EQUIPMENT

Consult with us about cost-saving alternatives

- Complete Configurations
- Individual CPUs-Peripherals
- Memory Upgrades and Feature Enhancements
- Classic and Spectrum Equipment

WE BUY
Highest Prices Paid

WE SELL
*All Items Sold Are Guaranteed for HP Maintenance
*Short and Long Term Leases Available

WE TRADE
Over 1000 satisfied Hewlett-Packard users are our customer references throughout the United States, Canada, Europe, and the Far East.

C.S.U. Industries, Inc.
395 Pearsall Avenue, Cedarhurst, NY 11516
Ask for Mord: (516) 239-4310
FAX (516) 239-8374

CIRCLE 205 ON READER CARD

I/O Data Systems, Inc.

Buy - Sell - Lease - Trade
HEWLETT-PACKARD
Systems, Workstations
Peripherals, Solutions

(216) 835-2211
27378 W. Oviatt
Bay Village, OH 44140
FAX: (216) 835-0220

Channel Partner

CIRCLE 272 ON READER CARD

Surety systems, Inc.

Hewlett Packard Equipment And Maintenance Services

- HP 9000
- HP 3000
- HP 700 Series Workstations
- HP Peripherals

(713) 466-9455

A World Apart. A Phone Call Away.

Channel Partner

COMPUTER ASSOCIATES
Business Partner

Advanced Matrix Technology

Houston, TX. FAX (713)466-9454

CIRCLE 226 ON READER CARD

NORCO COMPUTER SYSTEMS, INC.

Hewlett-Packard Quality at a NorCo Price

1000 • 3000 • 9000 • 700

**BUY—SELL
TRADE—LEASE**

Processors, Peripherals and Systems

21337 Drake Road
Cleveland, OH 44136-6620
FAX: 216-572-0636
216-572-4040 1-800-892-1920
(Outside Ohio)

CIRCLE 221 ON READER CARD

HEWLETT PACKARD

Depot Repair

- Expert Depot Repair
- 5 Day Turnaround
- Emergency Exchange Program

BLACK RIVER
COMPUTERS

1-800-837-0061
216-365-9950 Ohio
216-365-3916 FAX

CIRCLE 158 ON READER CARD

CONSULTANT **showcase**

SW Consulting, Inc. **SPEEDWARE**
Business Partner

Immediate Job Openings

SW Consulting, Inc. has immediate openings for candidates with the following HP3000 experience:

Speedware Cobol Turbo Image Omnidex/Imsam

Salaries for professionals with one or more of these skills range from **\$55k - \$85k/yr.** If you have any of these skills and are not earning top dollars for your knowledge and would like to pursue a career as an Information Systems Consultant, then mail or fax your resume to:

SW Consulting, Inc.
13180 N Cleveland Avenue Phone: (800) 494-4977
Suite 112 (941) 656-1011
N. Ft. Myers, Florida 33903 Fax: (941) 997-0456

We offer relocation packages and signing bonuses to consultants who qualify.

CIRCLE 255 ON READER CARD

HP SPECIALIST

CONTRACT & PERMANENT

26 YEARS OF PROFESSIONAL EXPERTISE

DAN KESLER
KEN WALTERS & ASSOC.
6685 FALLS OF NEUSE
SUITE 208
RALEIGH, NC 27615
919/847-7772
FAX: 919/676-1662

CIRCLE 195 ON READER CARD

Wanted: Authors

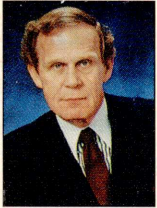
Publisher seeks computing experts to write books. Topics of interest include:

- ✎ Migrating from MPE/HP 3000 to HP-UX/9000
- ✎ Encina/9000 Transaction Monitors
- ✎ HP's OpenMail, OpenWarehouse, or SoftBench Programming
- ✎ Document Imaging with HP 3000 and HP 9000
- ✎ System/Network Management
- ✎ UNIX and PCs
- ✎ DCE Applications

Call Laura Derr for information at
(215) 643-8104 or
derrll@box101.cardinal.com

CBM BOOKS 1300 Virginia Drive, Suite 400
Fort Washington, PA 19034

Straight Talk



Andy Marken,
President
of Marken
Communications
Inc.

Large companies, small businesses and people with home offices are attracted to the Internet and the World Wide Web for many different reasons. But the goal is always related to gaining the edge that improved communications provides.

If all the promises of the Internet sound too good to be true, they may be. There are problems with the Net that the industry hasn't completely solved ... yet.

Ownership — The greatest strength of the Internet can also be its biggest problem — no one runs the Internet. Instead, groups of networks worldwide work together.

Approximately 100,000 networks connecting about 5 million computers (nearly 40 million users) in 103 different countries connect and interconnect to send and receive documents, data and images.

As the popularity of the Internet increases, the number of firms offering Internet connections continues to grow. Many of these organizations purchase bulk Internet service from providers with more robust backbones. Then, they resell service to individuals and small companies. Be sure to check out the history, financial strength, service, network capacity and capabilities of the Internet service providers you consider.

Security — As the largest shared data network in the world, the Internet, like any network, represents a serious security risk. Alternatives ranging from passwords to firewalls are available to protect your vital data from unwanted intrusion and computer viruses, however, users should be continually reminded that Internet E-mail isn't secure.

File Transport — Image-enhanced documents, spreadsheets and graphics can only be transported as formatted files if the sender and the recipient have the same operating system and applications software. Even inter-enterprise file transfers must often be sent in ASCII text form, because very few firms today have a single client-server operating system across their enterprise.

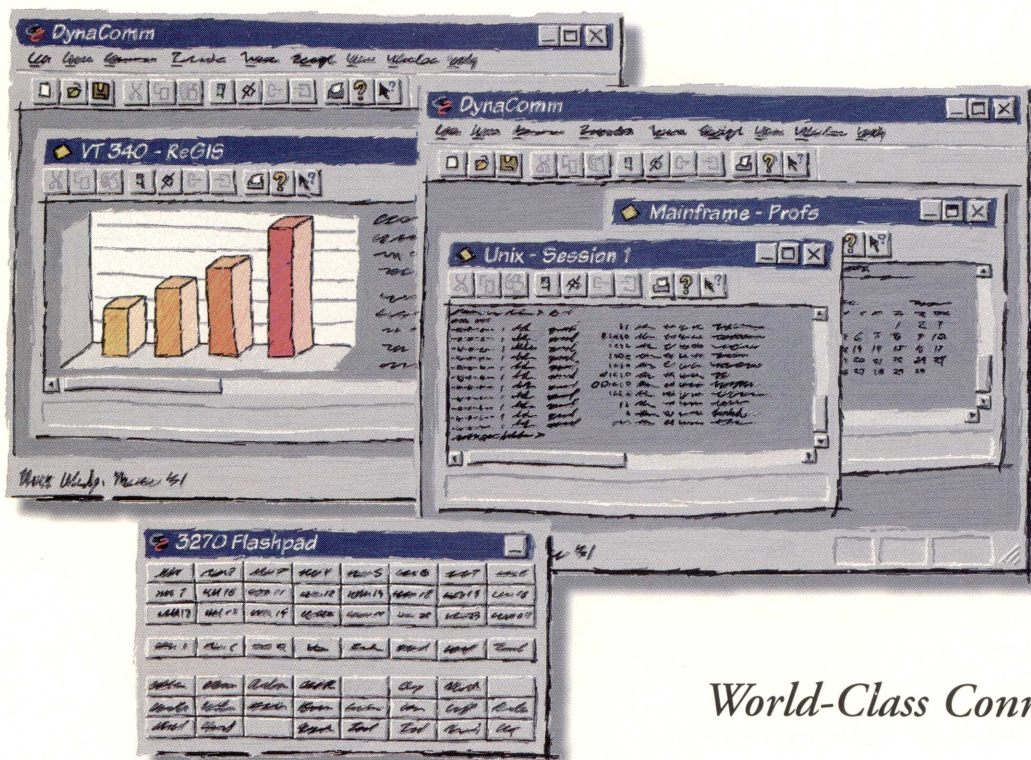
Navigation — Because of its ad hoc "design," the Web and Internet can be confusing to use. User-friendly Web browsers, people-oriented software front-ends and INet directories are being developed; but for the near future, it is up to you to find the search tools that are available, and then the company and information you need.

Delays — Because the Internet relies on so many different links, there are times when you will experience slow service. Of course, the same can be said for telephone or snail mail service, but when you become accustomed to immediate access and rapid response, it can be frustrating.

But remember, few things in the history of mankind have doubled in size every year. The Internet has been growing at this rate for the past few years, and will continue at this breathtaking pace for the foreseeable future. There are many issues surrounding the Internet that need to be resolved. But at this point, nothing else even comes close when it comes to giving a company or an individual an edge. — *Andy Marken is president of Marken Communications Inc. (Santa Clara, Calif.). He can be reached at (408) 986-0100 or marken@cerfnet.com.*

The DynaComm Connectivity Series

Enterprise-Wide Computing



World-Class Connectivity

The DynaComm® Connectivity Series provides comprehensive terminal emulation and complete network connectivity for accessing the most popular host systems.

With the all new modular design, the DynaComm Connectivity Series allows you to create a host access emulation system that will fit your particular need. The DynaComm Connectivity Series starts with the core module which contains numerous standard emulations, full network connectivity and a world-renowned scripting development environment.

Added to the core module are DynaComm client options for almost any type of host including advanced DEC, DG, HP, IBM and Tandem. Simply by adding the DynaComm client option(s) that you need, you will have a customized connectivity solution at your fingertips. A single executable instance of the product supports multiple sessions (both asynchronous and synchronous).

Multi-platform support is also available. With versions for both 16- and 32-bit platforms, the DynaComm Connectivity Series will be equally at home on Windows® 95, Windows® NT™ and Windows® 3.x. The consistent user interface and functionality across all operating systems facilitates easy migration and reduced training and support costs.

Major New Features Include:

- A single executable instance for multiple emulation sessions (asynchronous and synchronous)
- OLE compliance
- Windows 95 and Office 4.x "look and feel"
- Add-on emulation client options that provide "plug-and-play" capability to fit virtually any host environment requirements
- Consistent scripting language compatible across all emulations

DynaComm
by **FutureSoft**

12012 Wickchester Lane, Suite 600 • Houston, TX 77079
(713) 496-9400 • Fax (713) 496-1090
Nijverheidsstraat 12 • 2288 BB Rijswijk • The Netherlands
31-70-390-7727 • Fax 31-70-390-7005
Internet: info@fse.com or <http://www.fse.com>

For More Information Call: 1-800-989-8908

© 1986-1996 Future Soft Engineering, Inc. DynaComm, FutureSoft and Future Soft Engineering are registered trademarks of Future Soft Engineering, Inc. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corp. in the United States and/or other countries. All other trademarks are the properties of their respective owners or licensors.

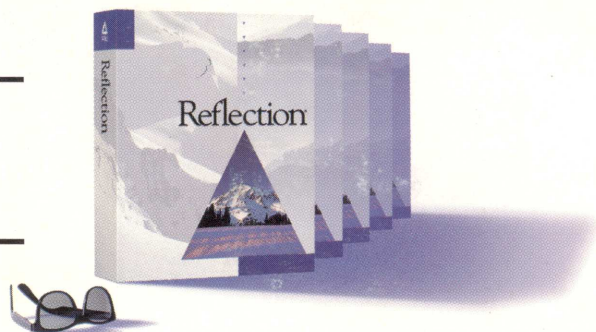
CIRCLE 190 ON READER CARD

03/96-40A/13

MONDAYS,
AS DESIGNED BY
NETWORK PROFESSIONALS.

PCWEEKLABS
**ANALYST'S
CHOICE**
OCT. 9, 1995
Reflection Suite for X 5.0

ENTERPRISE-WIDE
CONNECTIVITY, AS DESIGNED
BY NETWORK PROFESSIONALS.



If it were up to you, your hard work would finally pay off. Mainframes, PCs, minicomputers and servers would all fit together seamlessly, and Monday would be just another day at the beach.

REFLECTION® SOLUTIONS

REFLECTION PC-TO-HOST CONNECTIVITY SOFTWARE

- ▲ UNIX, X, HP, DIGITAL, AS/400 AND 3270 CONNECTIVITY
- ▲ WINDOWS, DOS, AND MACINTOSH PLATFORMS
- ▲ INTUITIVE OPERATIONS, FAST FILE TRANSFER, ADVANCED TEXT AND GRAPHICS EMULATION, AND POWERFUL PROGRAMMING TOOLS

REFLECTION NETWORKING SOFTWARE

- ▲ COMMUNICATIONS: TCP/IP, UDP, LAT, NS/VT, IPX/SPX, SLIP, CSLIP
- ▲ ARCHITECTURE: VxD/DLL DESIGN; 100% WINDOWS SOCKETS COMPLIANT
- ▲ FULL-FEATURED APPLICATIONS (FTP, LPR/LPD, INTERNET ACCESS)
- ▲ EASY CONFIGURATION AND MANAGEMENT
- ▲ OPTIMIZED FOR MOBILE/WIRELESS COMPUTING

AVAILABLE AS SUITES AND INDIVIDUAL PRODUCTS, TAILORED
FOR ANY ENTERPRISE CONFIGURATION.

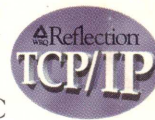
Impossible? Not with Reflection® from WRQ. Reflection offers complete, integrated PC connectivity software for your entire enterprise—including transport protocols, PC X server software, and terminal emulation. All with the management features, open standards, and service and support you need.

To try connectivity designed from your point of view, call today for a free evaluation copy. We'll make sure that from here on out, your Mondays go swimmingly.

For a FREE evaluation copy,
of any Reflection® product, call
800.926.3896

WRQ Reflection
CONNECTIVITY FOR A CHANGING WORLD

CALL 800.926.3896 IN EUROPE, CALL +31.70.375.11.00
OUTSIDE EUROPE, CALL 206.217.7100
INTERNET: sales@wrq.com WEB: http://www.wrq.com



WALKER RICHES & QUINN, INC. / 1500 DEXTER AVENUE NORTH, SEATTLE, WASHINGTON 98109 USA
FAX: 206.217.0293 ▲ BUITENHOF 47, 2513 AH DEN HAAG, THE NETHERLANDS / FAX: +31.70.356.12.44
LE DOMME BP 10910, 1 RUE DE LA HAYE, 95731 ROISSY CDG CEDEX FRANCE / FAX: +33.1.49.19.22.16
▲ WRQ AND REFLECTION ARE REGISTERED TRADEMARKS OF WALKER RICHES & QUINN, INC.
▲ ALL OTHER TRADEMARKS ARE THE PROPERTY OF THEIR RESPECTIVE HOLDERS.